

# BULLETIN OF MISCELLANEOUS INFORMATION      Appendix 1936 ROYAL BOTANIC GARDENS, KEW

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## REVIEW OF THE WORK OF THE ROYAL BOTANIC GARDENS, KEW, DURING 1936.

### General

STAFF.—Mr. W. DALLIMORE, I.S.O., V.M.H., retired from the post of Keeper of the Museums on March 31st, 1936. Dr. J. HUTCHINSON, F.L.S., Botanist in the Herbarium, was appointed to succeed him (K.B. 1936, 189).

Mr. H. K. AIRY-SHAW, Assistant Botanist in the Herbarium, was appointed to the post of Botanist as from April 1st, 1936. Mr. A. A. BULLOCK was appointed to succeed him as from June 30th, 1936.

Miss I. M. DAVIDSON was appointed to the new post of Sub-Assistant in the Library as from October 3rd, 1936.

Miss H. M. L. FORBES, Botanical Assistant in the Department of Agriculture and Forestry, S. Africa, has been transferred by that Department to the Herbarium for a period of one year, beginning June 22nd, 1936.

Mr. A. S. WILSON, Assistant Curator in charge of the Greenhouse and Ornamental Department, resigned his post on 31st December, 1936, to take up the appointment of Head Gardener to the Maharajah of Cooch Behar.

THE DIRECTOR was awarded the Grande Médaille à l'effigie d'Isidore Geoffroy St. Hilaire by the Société Nationale d'Acclimatation de France and received it in person in Paris on March 29th. On December 21st, at the Annual General Meeting of the New York Academy of Sciences, he was elected an Honorary Member of the Academy.

DR. HUTCHINSON was elected an Honorary Fellow of the American Amaryllis Society and a Correspondent of the Academy of Natural Sciences of Philadelphia.

OFFICIAL VISITS.—THE DIRECTOR represented the Royal Botanic Gardens, Kew, as the official delegate at the Centenary Celebrations of the University of London (June 29th) and the Centenary Celebrations of the Botanical Society of Edinburgh (July 1st) and presented addresses (see K.B. 1936, 393).

THE ASSISTANT DIRECTOR attended the meeting of the British Association at Blackpool in September and read a paper.

PUBLICATIONS.—Ten numbers of the “Kew Bulletin” were published during the year, and the Review of the work during 1935 was issued as an Appendix. The “List of Seeds” was published as a separate pamphlet.

A new booklet of 12 coloured views of the Gardens with descriptive titles was published (price 1s. 6d.) and eight new coloured postcards were issued. The “Illustrated Guide to the Gardens” was re-issued with several new photographs.

“The Cultivated Races of Sorghum” by Mr. J. D. Snowden was published in May by the Bentham-Moxon Trustees (see Annual Review, 1935, 636).

Part 2 of “The Flora of the Presidency of Madras” and vol. 2, part 2, of “The Flora of West Tropical Africa” were published in February.

### The Gardens

VISITORS.—The number of visitors to the Gardens in 1936 was 1,128,660—weekdays (except students’ days) 548,981 ; students’ days 77,092 ; Sundays 502,587—an increase of 37,440 as compared with the figures for 1935, due largely to fine weather during the months of May and August. The greatest monthly attendance was in May with 251,949, and the lowest in December with 10,080. The highest daily attendance was 59,858, on Whit Monday, June 1st ; the lowest was 13 on January 16th.

GENERAL.—The weather during 1936 included no long dry spells but was more or less showery throughout the year. This entailed less watering than in recent years, 22,800,000 gallons being used, as against 25,600,000 in 1935. In spite of this many of the larger trees still show the effect of droughts during the last few years. Their top branches are thin and bare and it is doubtful if some of them, especially beeches, will ever fully regain their former vigour.

The flagstaff is now the tallest in the Empire. We learn that the pole in front of the Court House at Vancouver, which just overtopped the Kew pole, has had to be removed on account of decay.

ARBORETUM.—The extension to the north-east side of the Bamboo Garden, referred to in the report for 1935, has been completed.

A further clearance of shrubs near the large group of evergreen oaks close to the North Gallery has been effected, and the *Staphylea* collection has been transferred to a new position on the south side of the flagstaff mound. The effect is to show to the best advantage what is one of the finest tree groups in the Gardens. Overcrowding in the *Euonymus* collection called for rearrangement, which has been carried out with good results.



The large transplanting machine which had been in use for some 80 years, and which had become worn out beyond repair, has been replaced by a new machine of similar type, but incorporating several improvements.

In the Arboretum Nursery, the old line of span-roofed frames, used for Temperate House plants, has been replaced by a new span-roofed pit, with a central path, resulting in better working conditions.

TEMPERATE HOUSE.—For some years the roof has leaked, causing considerable damage to the plants. During the past summer re-roofing was commenced. The lower roof on the west side of the house was reconstructed, western red cedar being used, and was glazed with larger panes of glass and fitted with continuous ventilators at top and bottom. This gives better ventilation and increased light. It is expected that the plants will greatly benefit thereby. The work is to be continued until the whole of the central portion of the house has been re-roofed

*Lobelia Gibberoa* flowered during the summer, reaching a height of nearly 30 ft.

TROPICAL DEPARTMENT.—Palm House. The interior of the north wing has been repainted and the panes of tinted glass have been replaced with clear glass. At the same time all the hot water pipes beneath the side stages in the north end of the house were thoroughly overhauled, reconditioned and rearranged, an opportunity which allowed the construction of a bed better suited to the requirements of climbing plants. The stages have been reconstructed and so arranged that greater depth of shingle can be used for the retention of moisture.

T Range.—The preliminary experiments carried out last winter in connection with the injury to plants caused by fog are being continued, and to facilitate this work an electric power cable has been laid to the T Range, so as to operate fans in the Begonia and Orchid houses. A neon lamp has also been installed in House 14C (see p. 553).

South African House.—The planting has been completed and practically all the plants appear to be well established and growing freely. This is due, no doubt, to the provision of adequate root run which affords natural and equable conditions.

Melon Yard.—The Tropical Propagating Pits 17A and B, the roofs of which were beyond repair, have been entirely reconstructed and converted into one house, with central and side stages built of reinforced concrete. There has been a complete rearrangement of the heating system, including overhead heating, and tanks for rain water and for the cultivation of aquatic plants have been

provided. Western red cedar was employed for the wood work. The new house provides improved cultural conditions.

Electric light has been installed in the Tropical and Decorative potting sheds, offices and stores.

*Beloperone guttata*, exhibited at the Royal Horticultural Society on September 29th, 1936, was given an Award of Merit, and later in the year was awarded the Sander Medal for the best greenhouse plant exhibited during 1936.

HERBACEOUS DEPARTMENT.—Several small sections of the Rock Garden have been rebuilt and fresh compost introduced. Amongst the most interesting plants flowered in 1936 were *Caltha sagittata* and *Ranunculus uniflorus* from Tierra del Fuego; *Fritillaria* spp., including *F. Purdyi*, *F. Olivieri*, *F. oranensis* and *F. biflora*; *Penstemon Adamsianus*, *P. Smallii*, *P. Roezlii* and *P. Jaffrayanus*; *Primula bellidifolia* and *P. Sherriffae*, both collected by Messrs. Ludlow and Sherriff; *Digitalis Mariana* collected by Mr. E. K. Balls; *Campanula maroccana* and *Linaria lurida* from the Atlas Mountains, collected by Mr. J. Gattefossé; *Gentiana pedicellata* from the Himalayas, and *Gentiana Makinoi* from Japan.

STUDENT GARDENERS.—The recent lessening of the economic depression has not yet had sufficient time to show any appreciable reaction on the movements of students, but the number of men (fifteen) who completed their training and secured appointments is a slight advance on 1935.

*Outgoing Students*.—In this country five appointments were secured in Parks Departments, a similar number in nurseries or private gardens, and one with the Middlesex County Council. Overseas there were three appointments as follows: Cyprus (private garden); Bahrain Islands, Persian Gulf (Californian Standard Oil Co. Ltd.); Trinidad (Botanic Garden); and one student returned home to South Africa.

*Incoming Students*.—Fifteen men (all British subjects) were recruited as follows: Parks Departments (six), nurseries and private gardens (four), John Innes Horticultural Institution (one), Cambridge Botanic Garden (one), Sheffield Education Committee (one). One student returned from La Mortola, and another from Spain (Cap Roig), the period in the latter case being shortened owing to the disturbed state of the country.

Eight students (double the number of the previous year) visited overseas countries through exchange arrangements made with the following botanical and horticultural establishments:—

The Ontario Agricultural College, Guelph, Canada; the New York Botanical Garden; the Arnold Arboretum; the Berlin Botanic Garden; Sans Souci Gardens, Potsdam; Luxembourg Gardens, Paris; and trade nurseries in New Zealand and Switzerland.



In addition two students from Great Britain, one from India, four from Holland, and one from Norway, worked in the Gardens as voluntary students for varying periods.

#### RAINFALL RECORD.

Rainfall recorded at the Royal Botanic Gardens, Kew, during 1936 :—

Inches.				Inches.			
January	...	...	3·87	July...	...	...	2·32
February	...	...	1·53	August	...	...	·41
March...	...	...	·80	September	...	...	2·28
April ...	...	...	1·43	October	...	...	1·60
May ...	...	...	·48	November	...	...	2·83
June ...	...	...	3·44	December	...	...	1·44

Total 22·43 inches.

The total for 1935 was 24·52 inches.

**WATERFOWL.**—Mr. A. Ezra of Foxwarren has very generously presented a male Stanley crane to replace the one sent over from Pretoria in 1935 which, unfortunately, died during the summer ; he also gave a female carolina to complete our pairs of these ducks. A pair of South African shellduck was received as a present from St. James's Park. The following additions to the collection were, received by way of exchanges : one pair garganey teal, one pair shovellers, two female carolinas, one pair chili teal and one pair cinnamon teal.

During the year 105 grey squirrels have been shot—but unfortunately they have not yet been exterminated—and 66 rats have been destroyed.

**CONTRIBUTIONS TO THE GARDENS, 1936.**—The following is a summary of the items of most interest amongst the 1020 separate consignments of plants, bulbs, seeds, etc., received during the year :—

#### *Public Institutions :—*

Amani, East African Agricultural Research Station.—Seeds, including *Impatiens Oliveri* and *Edithcolea* sp., and bulbs of *Bowiea kilimandscharica*, collected and forwarded by Mr. P. J. Greenway.

Berlin, Botanic Garden.—A large collection of seeds.

Cambridge, Botanic Garden.—Alpine, herbaceous, aquatic and stove plants ; seeds of *Callitris oblonga* and *C. rhomboidea* from Tasmania.

Canton, Sun Yatsen University.—Seeds of *Zenia insignis*, gen. & sp. nov.

Chelsea Physic Garden, London.—Plants, including *Alsophila*, *Nepenthes* and *Streptocarpus* spp.

- Christchurch, New Zealand, Botanic Garden.—101 packets of seeds.
- Coimbra, University Botanic Garden.—Seeds, fern spores and cuttings.
- Concepcion, University Botanic Garden.—Seeds, including *Puya alpestris*. Plants of *Sarmienta repens* and *Polypodium Feuillei*.
- Darwin, Northern Territory of Australia, Botanic Gardens.—Seeds of *Cycas media* packed in fresh seed of *Callitris intratropica*.
- Dehra Dun, Forest Research Institute.—Several consignments of seeds, also bulbs and rhizomes.
- Dresden, Botanic Garden.—81 packets of seeds.
- Dunedin, Botanic Gardens.—Plants and seeds.
- Edinburgh, Royal Botanic Garden.—Plants, including *Nepenthes*, *Hoya*, *Gentiana*, *Medinilla*, *Primula*, *Saurauja* and *Pratia* spp. ; also various seeds, including *Bejaria* (*Befaria*) *racemosa* from Florida, and a consignment sent home by Forrest's collectors, distributed at the request of Lord Aberconway.
- Falkland Islands, Government House, Port Stanley.—Plants, including *Leucera gossypina*, *Pernettya pumila* and *Blechnum penna-marina*.
- Federated Malay States, Department of Agriculture, Kuala Lumpur.—Wardian case of plants of *Nephelium lappaceum* (for re-shipment, when in a fit condition, to Trinidad).
- Glasnevin, Botanic Garden.—Plants, seeds and cuttings.
- Gold Coast, Department of Agriculture, Accra.—A shipment of plants, tubers and seeds ; also tubers of orchids (from Kumasi).
- Gold Coast, Forestry Department, Kumasi.—Fruits of *Antrocaryon micraster*.
- Grahamstown, Albany Museum Herbarium.—Bulbs of *Drimia Hawthorthioides* and *Faucaria Gratiae*.
- Hamburg, University Botanic Garden.—A shipment of stove, decorative and insectivorous plants.
- Hong Kong, Botanical and Forestry Department.—A Wardian case of plants of *Saururus*, *Houttuynia* and *Gymnotheca* species ; seeds, including *Camellia*, *Quercus* and *Tutcheria* spp.
- Hong Kong, Department of Biology, The University.—A Wardian case of plants, including species of *Tutcheria*, *Schima*, *Gordonia*, *Homalium*, *Acanthophippium* and *Camellia* species.
- Hyde Park, London.—Plants and seeds.
- John Innes Horticultural Institution, Merton.—Plants of *Calceolaria*, *Primula*, *Pelargonium* and *Streptocarpus* species.
- Innsbruck, Botanic Garden.—Seeds of *Viscum album* grown upon *Pinus montana* and *Abies pectinata*.
- Jamaica, Hope Gardens.—A Wardian case of ferns collected in the mountains at 5,000 ft.



- Khartoum, Forestry Department.—Plants of *Pelargonium*, *Caralluma*, and *Kniphofia* species.
- Khartoum, Government Gardens.—Seeds, corms and a shipment of plants.
- Kimberley, McGregor Memorial Museum.—Seeds of *Ammocharis*, *Nerine*, *Hermannia* spp., etc.
- Kirstenbosch, Bolus Herbarium.—Plants and cuttings, including species of *Stomatium*, *Rhinephyllum*, *Chasmatophyllum* and *Bergeranthus*; also plants of 7 species of *Faucaria*—which were collected by Dr. C. L. Leipoldt at the Oograbies Falls.
- Kirstenbosch, National Botanic Gardens.—Plants, including *Hemitelia capensis* and *Pelargonium rapaceum*, and several consignments of seeds.
- Körnig, Gardens and Arboretum.—Plants, including *Betula carpartica*, *B. Hoseri*, *Tilia diversifolia* and *Acanthopanax Henryi* var. *nana*.
- Leningrad, Botanic Garden.—Seeds.
- Madras, Government House Gardens.—Wardian case of plants, seeds of trees and shrubs.
- Madrid, Botanic Garden.—43 packets of seeds.
- Moscow, All Union Research Institute of Agricultural Forest Melioration and Forest Management.—Seeds of trees and shrubs.
- Munich, Botanic Garden.—83 packets of seeds and fern spores.
- Nairobi, Coryndon Memorial Museum.—Seeds of *Caralluma* sp. nov.?
- Nanking, Botanic Garden of Dr. Sun Yatsen's Memorial Park.—174 packets of seeds collected in Szechuan, comprising many interesting species and genera.
- New York, Botanic Garden.—A collection of Begonias, varieties of *Verbena canadensis*, and seeds—various.
- New Zealand State Forest Service, Wellington.—A collection of seeds of New Zealand indigenous species.
- Oxford, University Expedition to Sarawak, 1932.—Seeds of a new Rubiaceae plant allied to *Neurocalyx*.
- Paris, Muséum national d'histoire naturelle.—A collection of orchids and stove plants.
- Penang, Gardens Department.—A Wardian case of plants including species of *Cyathea*, *Mesochlaena*, *Dipteris*, and *Nephrolepis*; spores of *Dipteris* and *Gleichenia* spp.
- Port Elizabeth, Parks and Town Attractions Department.—Seeds, including *Gethyllis*, *Amorphophallus*, *Encephalartos*, and *Pelargonium* spp.
- Pretoria, Division of Plant Industry.—Seeds of *Stapelia* and *Alberta magna*.
- Rio de Janeiro, Botanic Garden.—Plant of *Gymnocalycium denudatum*.

- Singapore, Botanic Gardens.—A Wardian case of orchids ; seeds and fern spores including species collected in the Cameron's Highlands.
- Stellenbosch, University Botanic Gardens.—Seeds—69 packets—including *Roridula Gorgonias*.
- Taschkent, Botanic Garden of the University of Middle Asia.—Seeds.
- Tokyo, University Botanic Garden.—Seeds.
- U.S. Department of Agriculture, Washington.—Seeds, including economic subjects from Coconut Grove, Florida.
- Westonbirt, The Arboretum.—Plants—a collection of species and varieties of *Acer*, also *Aronia arbutifolia* var. *erecta*.
- Wisley, Royal Horticultural Society's Gardens.—Plants, cuttings, seeds and bulbs.
- Wuchang, Hupeh, Wu-Han University.—Fruits of *Poupartia chinensis*, procured by Prof. H. H. Chung.

*Private Donors :—*

- Mr. Edwin Ashby, Blackwood, South Australia.—Seeds, including *Kunzea ambigua* and *Casuarina stricta*.
- Mr. E. K. Balls, Knebworth.—Plants of *Iris Histrio* var. *aintabensis* ; collections of seeds, bulbs and plants from Morocco.
- Mr. Geoffrey Beal, Chatham, Ontario.—Seeds of *Asimina triloba* and *Nelumbo lutea*.
- Col. C. Beddington, London.—Seeds of *Lithospermum diffusum* ; bulbs and tubers from Palestine ; cactus seedlings.
- The Brookside Nurseries, Ltd., Headington, Oxford.—Alpine plants, *Daphne petraea* var. *grandiflora*, and a collection of named varieties of *Helianthemum*.
- Mr. C. S. Causdale, C/o Imperial Forestry Institute, Oxford.—Ground orchids and *Crinum*s from Afram Plains, N.E. Ashanti.
- The Right Hon. Neville Chamberlain, M.P., London.—Orchids—a large collection of species and varieties of *Masdevallia*.
- Mrs. E. M. Cheatham, Hawaii.—Seeds and tubers of *Begonia sandwicensis*.
- Mr. R. B. Chillias, Jnr., Germantown, Philadelphia.—Seeds, including *Amianthium muscaetoxicum*, a very rare species.
- Col. Stephenson R. Clarke, Haywards Heath.—Plants, including species of *Acer*, *Pyrus* and *Quercus*.
- Messrs. W. A. Constable Ltd., Tunbridge Wells.—Bulbs of *Lilium* spp. and varieties.
- Mr. J. Davis, Belmore, New South Wales.—Fern spores.
- Mr. L. Denny, Strawberry Hill, Middlesex.—Large collections of cacti and succulents.
- Dr. A. Ducke, Manaos, Brazil.—Seeds of *Einsteinia sericantha*.
- Mr. Selwyn Duruz, Wallington.—A choice collection of orchids, and plants of *Pinguicula* and *Hippeastrum* spp.



- Mr. J. E. Edwards, Gibraltar.—Plants of *Viola arborescens* and *Orchis speculum*.
- Mr. T. M. Endean, Laindon.—A collection of South African succulents.
- Captain Esme Erskine, C/o Foreign Office, London.—Seeds and tubers from Western Abyssinia.
- Mrs. G. Foggitt, Thirsk.—British plants, originally from wild localities.
- Mr. G. B. Foote, Puwakpitiya, Ceylon.—Plant of *Coelogyne Rochussenii*.
- Mrs. H. A. Fowler, Winnipeg.—Several consignments of seeds ; plants of *Cypripedium*, *Polygala*, *Meriolix* and *Aster* spp.
- Lady Game, Ham Common.—A collection of orchids.
- H.R.H. The Duke of Gloucester.—Seeds of *Eucalyptus* and *Acacia* species.
- Mr. B. J. Gould, Lhasa, Tibet.—A collection of plants from the Sikkim-Tibet border.
- Mr. H. Harris, Richmond, Surrey.—Orchids, fruits and seeds collected in the Amazon river valley.
- Miss Thistle Y. Harris, Sydney.—A consignment of ferns, and a collection of Australian fruits and seeds.
- Count Hirotarō Hayashi, Tokyo.—74 packets of seeds.
- Messrs. Henry A. Heys & Co., Wimbledon.—Two cases of *Lilium* bulbs.
- Messrs. Hillier & Sons, Winchester.—A large collection of trees and shrubs.
- Mr. G. B. Hinton, Mexico.—A collection of plants including orchids, *Gentiana salpinx*, *Selaginella lepidophylla*, also many consignments of miscellaneous seeds.
- Hocker Edge Gardens, Cranbrook.—A collection of plants, bulbs and rhizomes, including *Iris nigricans* and *I. atropurpurea* collected by Col. C. H. Grey.
- Lady Hosie, Oxford.—Seeds of *Osmosia Hosiei* and of a weeping variety of *Ginkgo biloba*, from Szechwan, China, collected by Mr. S. Dye, a Canadian Scientific Missionary.
- Mr. G. P. Ingram, Barhan, United Provinces, India.—Roots of two ferns and ? *Potentilla* sp.
- Mr. W. A. Ingram, Ballykelly, Ulster.—Seedlings and seed of species and varieties of *Echium*.
- Messrs. W. E. Th. Ingwersen, Ltd., East Grinstead.—A collection of alpine plants.
- Messrs. George Jackman & Son, Woking.—Plants, including a collection of named varieties of *Clematis*.
- Mr. W. A. Knight, St. Augustine, Fla., U.S.A.—Seeds of the very rare *Elliottia racemosa*.
- Mr. C. H. Lankester, Costa Rica.—Plants and seeds, and a splendid collection of orchids.

- Mrs. J. R. Leach, Portland, Oregon.—Plants of *Kalmiopsis Leachiana* (a very rare species), and *Bensonia oregona*.
- Dr. F. Lemperg, Hatzendorf.—Plants and seeds, many of which were collected during his 1936 expedition to Albania and Serbia.
- Mr. H. Q. Levy, Brown's Town, Jamaica.—Two consignments of orchids, including *Laelia monophylla* and *Comporetta falcatum*.
- Lady Loch, London.—Plant of *Chrysanthemum japonicum* var. *sibiricum latilobum*.
- Mr. W. J. Marchant, Stapehill, Wimborne.—Shrubs, also plants of *Shortia uniflora* var. *grandiflora*, and *Phyllodoce hybrida*.
- Mr. W. E. Marriott, Durban.—Two plants of *Encephalartos Ghellinckii* (collected on the Drakensberg) forwarded through the Natal Herbarium.
- Mr. E. M. Massam, Ndola, Northern Rhodesia.—Tubers and seeds of *Begonia Homblei*.
- Mr. H. E. Maude, Gilbert Islands.—Seeds of *Boerhaavia*, *Euphorbia*, *Sida* and *Triumfetta* spp.
- Mr. F. W. Millard, East Grinstead.—Alpine and herbaceous plants.
- Lord Moyne, London.—Orchids, including *Gramatophyllum*, *Dendrobium* and *Spathoglottis* spp.
- Mr. H. Murdock, Queens Park, Western Australia.—A large and interesting collection of seeds of indigenous plants.
- Capt. Neil McEchearn, Pallanza.—A collection of Cannas.
- Miss G. M. Newton, Thetford.—Roots of the butterfly orchis from a plantation soon to be the site of an aerodrome.
- Mr. D. J. Oman, Rustington.—Plants, *Crinum giganteum*, *Nephrolepis rufescens* (?) and *Polypodium Phymatodes*.
- Mr. J. Overall, Sulphur Creek, Tasmania.—29 packets of seeds, including *Fagus Cunninghamii*.
- Mr. Otto C. Overbeck, Salcombe.—A collection of Stapelias—25 spp.
- Dr. L. R. Parodi, Buenos Aires.—Seeds of *Oryza subulata*, a very rare grass.
- Messrs. Perry's Hardy Plant Farm, Enfield.—A choice collection of aquatic plants from Florida ; corms and seeds.
- Mrs. J. B. Priestley, Highgate Village.—Seeds of *Atriplex hymenelytra* and *Enceliopsis Covillei* from Death Valley.
- Mr. D. Pringle, Port Elizabeth.—A collection of succulents, forwarded to Kew in the care of Mrs. A. Turner, Felixstowe.
- Mr. C. A. Purpus, Vera Cruz, Mexico.—Interesting consignments of plants, bulbs and seeds.
- Dr. W. Rama, Madagascar.—Orchids, including *Angraecum*, *Grammangis*, *Cymbidiella* and *Eulophiopsis* spp.
- Mr. G. C. Reynolds, Johannesburg.—Seeds of *Aloë polyphylla* from the type locality.



- Mr. C. Gilbert Rogers, Etchingam, Sussex.—Seeds and corms of *Homoglossum Watsonioides* from Mt. Kilimanjaro ; seeds from California collected by Mr. F. Nutter Cox.
- Hon. Mrs. E. F. Ryder, Beaulieu.—A collection of succulents and cuttings of *Swainsonia galegifolia*.
- Messrs. Sanders, St. Albans, Ltd.—Orchids and tubers.
- Mr. F. D. Sandeman, Kingennie, Angus.—Plants and seeds of *Primula* spp., including *P. Winteri*.
- Dr. H. Schaefer, Sumatra.—Tubers of *Amorphophallus titanum*.
- Mr. H. B. Sharp, Rumuruti, Kenya Colony.—Seeds and bulbs collected near Lake Rudolf and on Mt. Nijiro.
- Mr. H. W. Simmonds, Tunbridge Wells.—Plants of *Hibiscus* species from Fiji.
- Mr. Herbert J. Solomon, Sydney.—Plants of the exceedingly rare *Rhododendron Lochae*.
- Sir Aurel Stein, Kashmir.—A consignment of seeds from the Vale of Kashmir.
- Major F. C. Stern, Goring-by-Sea.—A collection of *Iris* ; plants, cuttings, and seedlings.
- Mr. H. L. Stinson, Seattle, Washington.—Seeds of *Iris Douglasiana* (dwarf form), *I. tenax*, *I. tenax* x *I. Douglasiana* (from West Oregon), and *Fraseria speciosa*.
- Mrs. Symes, Warnunglid, Sussex.—Seeds from Mt. Everest.
- Mr. R. S. Trickett, Ealing.—Plants, including a magnificent specimen of *Viburnum Carlesii*.
- Mr. A. C. Trott, Tehran.—Seeds, bulbs and rhizomatous plants from Iran.
- Mrs. A. Turner, Felixstowe.—A collection of succulents from South Africa, assembled by Mr. D. Pringle, Port Elizabeth.
- The Executors of the late Lord Wakehurst, Ardingly.—Plants, including *Machilus ichangensis*, a rare species ; *Chusquea andina* and *Drimys Winteri* var. *latifolia*.
- Mr. F. A. Weinthal, Roseville, N.S.W.—Plants, including *Dendrobium*, *Cymbidium* and *Sarcochilus* spp. ; seeds of *Drosera* and *Stylidium* spp.
- Lord Wigram, Windsor.—A collection of seeds from Nepal.
- Mr. G. E. Wolstenholme, La Paz, Bolivia.—A consignment of tubers, red, yellow and white, of *Oxalis tuberosa* ; seeds of *Tropaeolum Seemannii* and *Cajophora* sp.
- Mr. R. W. Younger, Magallanes.—Seeds.

DISTRIBUTION OF PLANTS AND SEEDS.—At the commencement of the year the annual distribution of seeds resulted in 184 separate consignments being despatched, comprising 5,468 packets of herbaceous plants and 4,510 packets of trees and shrubs. The aggregate shows a slight decrease (57 packets) as compared with the previous year.

Special distributions were made of plants of *Loxsonia Cunninghamii*, and seeds of *Ammocharis coccinea*, *Zea Mays*, *Viscum album*, *Nerine lucida*, *Arbutus Menziesii*, *Cornus Nuttallii*, *Cornus florida*?, *Crossandra undulataefolia*, *Dendromecon rigidum*, *Camellia hongkongensis*, and *Aloe polyphylla*.

Overseas shipments of plants were as follows:—Agricultural Departments of Jamaica, Trinidad, and St. Helena. Botanic Gardens of New York, Singapore and Trinidad; Government Gardens, Khartoum; Government House, Cyprus; H. E. the Governor of Bihar and Orissa; Imperial College of Tropical Agriculture, Trinidad; British Consulate, Lourenco Marques; East African Agricultural Research Station, Amani; Parks and Gardens, Department, Cape Town; Department of Biology, Hong Kong University; Bolus Herbarium, Kirstenbosch, and the Borough of Port Chalmers, New Zealand.

Other recipients of plants, etc., included the following:—

*Institutions:—*

Admiralty Compass Observatory, Slough.—A collection comprising 30 plants of *Populus* spp. and vars.

Amani, East African Agricultural Research Station.—Plants of *Lonchocarpus nicou*.

Arnold Arboretum, Atkins Institute, Cuba.—A collection of *Euphorbia* spp.

Arnold Arboretum, U.S.A.—Hardy trees and shrubs.

Berlin, Botanic Garden.—A collection of orchids; grafts and cuttings of hardy trees and shrubs.

Bristol, Corporation Parks Department.—A collection of 250 plants, principally temperate subjects.

Cambridge, Botanic Garden.—A collection of *Nepenthes* spp. and stove subjects; plants, cuttings and tubers of *Nymphaeas*.

Chelsea Physic Garden, London.—Plants, including *Dicksonia Wendlandii*.

Copenhagen, University Botanic Garden.—Hardy trees and shrubs.

Dunedin, Botanic Gardens.—99 packets of seeds.

Edinburgh, Royal Botanic Garden.—Plants and seeds, including *Camellia maliflora* and *Nepenthes bicalcarata*.

Egypt, The Egyptian University, Cairo.—150 packets of seed of herbaceous and alpine plants.

Eton College, Windsor.—*Lilium* spp., and aquatics.

Gibraltar, Government House Gardens.—A collection of bulbous plants and cuttings of *Penstemon* spp.

Glasgow, Parks Department.—A collection of seedling Mexican oaks.

Glasnevin, Botanic Garden.—Plants of *Erlangea pulchra*.

Green Cross Society, London.—Seeds of British native plants.



- The Hague Public Parks, Holland.—Grafts and cuttings of hardy trees and shrubs.
- Hamburg, University Botanical Institute.—A collection of *Nepenthes* and filmy ferns; seeds of *Lilium* spp. and *Rhododendron* spp.
- Holloway, H. M. Prison.—A collection of herbaceous plants.
- Imperial War Graves Commission, Arras, France.—Plants of *Eucalyptus coreacea* and *Cupressus arizonica*.
- John Innes Horticultural Institution, Merton.—Plants, including *Nepenthes* spp.
- Jamaica, Hope Gardens.—A collection of named varieties of *Dahlias* and miscellaneous plants.
- Kew Observatory, Richmond.—Trees, shrubs and herbaceous plants.
- Kiel, Botanic Institute.—A collection of *Pelargonium* spp.
- Kingston-on-Thames, Cambridge Home for Soldiers' Widows.—A collection of flowering shrubs.
- Leningrad, Botanic Garden.—Seeds, including *Victoria regia*.
- Lisle, Morton Arboretum, U.S.A.—A collection of grafts and cuttings of hardy trees and shrubs.
- London Passenger Transport Board.—Collection of Fuchsias and Irises.
- Metropolitan Police College, Hendon.—Trees and shrubs.
- Middlesex County Council, Roads Department.—Plants of *Berberis lologensis* and *Cotoneaster serotina*.
- Moscow, University Botanic Garden.—Plant of *Victoria regia*.
- New York, Botanic Garden.—Seeds of *Victoria regia* and a collection of *Saxifraga* spp.
- Oslo, University Botanic Garden.—A collection of orchids and stove plants.
- Paris, Muséum national d'histoire naturelle.—A collection of orchids.
- Salford, Parks Department.—Stove, economic and aquatic plants.
- Singapore, Botanic Gardens.—A collection of Rhododendrons.
- St. Helena, Agricultural and Forestry Office.—A collection of named varieties of oil-producing lavenders.
- Sydney, N.S.W., Department of Agriculture.—Seeds, including *Allium* spp., alpine and herbaceous plants.
- Trinidad, Department of Agriculture.—Rambutan plants; received from Federated Malay States.
- Trinidad, Imperial College of Tropical Agriculture.—Musas in variety.
- Trinidad, Royal Botanic Garden.—Plants, seeds and corms.
- Washington, United States Department of Agriculture.—Plants of *Arundinaria* spp.
- Zoological Society, Regent's Park.—A collection of stove plants.

*Private Recipients :—*

- Sir F. D. Acland, Bart., Killerton, Devon.—Seedling *Rhododendrons*.
- Mr. J. Adlard, East Horsley, Sussex.—*Nymphaeas*.
- Mr. D. J. Bethell, Englefield Green.—Plants including *Sparmannia africana* and *Cestrum Newellii*.
- Dr. R. Bevan, Henley-on-Thames.—Herbaceous and alpine plants.
- Viscount Bledisloe, Lydney Park, Glos.—*Aesculus indica*.
- General Sir Walter Braithwaite, Royal Hospital, Chelsea.—Plants of *Aesculus indica*.
- The Brookside Nurseries Ltd., Headington, Oxford.—Hardy trees and shrubs ; alpine and herbaceous plants.
- Messrs. Burkwood & Skipwith, Kingston-on-Thames.—Hardy trees and shrubs.
- Lt.-Col. the Rt. Hon. H. H. Spender-Clay, Lingfield, Surrey.—Plants, including *Erica Pageana*, *Libertia ixioides* and *Aesculus indica*, also a collection of Camellias.
- Prof. Valeria Colmegna, Como, Italy.—Seeds of *Lilium* spp.
- Dartington Hall, Totnes.—Plants and seeds.
- Mr. L. Denny, Strawberry Hill, Middlesex.—A collection of stove plants.
- Donard Nursery Co., Newcastle, Co. Down.—Grafts of *Hamamelis mollis* and hardy shrubs.
- The Very Rev. The Dean of Durham.—A collection of shrubs, including *Rhododendrons* in variety.
- Mr. C. Eley, East Bergholt.—A collection of conifers.
- Mr. A. S. Elson, Bahrain Island, Persian Gulf.—A collection of seeds, and plants of *Mesembryanthemum* spp.
- Mr. R. G. Evans, Roundhill, Nova Scotia.—A collection of border *Chrysanthemums*.
- Mr. W. Arnold Forster, Zennor, St. Ives.—Camellias.
- Mrs. H. A. Fowler, Winnipeg.—Plants of *Gentiana Farreri* and *G. sino-ornata*.
- Lady Game, Ham Common.—Succulents and a plant of *Brunfelsia calycina* var. *macrantha*.
- Mr. J. A. Gellatly, Westbank, B.C.—Grafts of *Corylus* spp.
- Col. C. H. Grey, Hocker Edge, Cranbrook.—Seeds and plants, including *Epacris miniata*, and *Lapageria rosea* var. *superba*.
- Dr. R. Giuseppi, Felixstowe.—Plants, including *Drapetes Dieffenbachii*.
- Capt. H. G. Hawker, Strode, Ermington.—A collection of *Crocus* spp., and bulbs of *Narcissus Watieri*.
- Messrs. Hillier & Sons, Winchester.—Hardy trees and shrubs.
- Captain C. Ingram, Benenden.—Seedling Mexican oaks, and trees and shrubs.
- Messrs. George Jackman & Son, Woking.—Hardy shrubs.
- Hon. Robert James, St. Nicholas, Richmond, Yorks.—Plants of *Pelargonium salmoneum*.



- Major L. Johnston, Mentone.—Collection of half-hardy trees and shrubs.
- Knap Hill Nursery Ltd., Woking.—Plants, including trees and shrubs.
- Messrs. Laxton Bros., Bedford.—Hardy trees and shrubs.
- Mr. H. Q. Levy, Brown's Town, Jamaica.—Orchids.
- Miss N. Lindsay, Abingdon.—Collection of shrubs.
- Messrs. Stuart Low & Co., Enfield.—Grafts of *Hamamelis mollis*.
- H.M. Queen Mary, Marlborough House.—A collection of flowering trees and shrubs.
- Capt. Neil McEhearn, Pallanza.—A large collection of plants including *Fuchsia* spp.
- Lt.-Col. L. C. R. Messel, Nymans, Handcross.—Grafts of *Magnolia Dawsoniana*.
- Mr. F. W. Millard, East Grinstead.—Alpines and *Rhododendron* spp.
- Mr. C. W. Christie Miller, Henley-on-Thames.—Orchids.
- The Earl of Morley, Saltram, Devon.—Mexican oak seedlings.
- Mr. G. H. Murdock, Freemantle, Australia.—A collection of ferns and stove plants.
- Mr. H. Nalder, Cork, I.F.S.—Plants of *Kalanchoë* and *Cotyledon* spp.
- Dr. W. E. de Nol, Amsterdam.—Bulbs of *Hyacinthus* and *Muscari* spp.
- Prof. F. W. Oliver, Limpsfield, Surrey.—A collection of *Stapelia* spp.
- Mr. D. J. Oman, Rustington, Sussex.—Stove plants, including *Nepenthes Henryana*.
- Mr. J. Overall, Sulphur Creek, Tasmania.—A miscellaneous collection of plants including *Erica* spp.
- Major Albert Pam, Broxbourne.—Plants, including *Glyptostrobus heterophyllus* and *Sollya Drummondii*.
- Mr. I. B. Parker, Bradford.—Economic plants.
- Mr. S. R. B. Pask, St. Paul's School, West Kensington.—A collection of insectivorous plants.
- Dr. W. Rama, Madagascar.—A collection of orchids.
- Mr. Lionel de Rothschild, Exbury.—Nymphaeas.
- Messrs. L. R. Russell Ltd., Windlesham.—*Rosa* spp. (budding material).
- Messrs. B. Ruys Ltd., Dedemsvaart, Holland.—Plants and cuttings, including *Aesculus* spp.
- Mr. F. D. Sandeman, Kingennie, Angus.—Alpines.
- Messrs. Sanders, St. Albans, Ltd.—Orchids.
- Mr. G. C. Sankey, Hastings.—Pelargoniums.
- Mr. T. Sharp, Westbury.—Succulents and a collection of aquatic plants.
- Major P. Slessor, "Toc H," Poperinghe, Belgium.—A collection of New Zealand plants.

- Messrs. W. C. Slocock Ltd., Woking.—Plants, grafts and cuttings of hardy trees and shrubs.
- Major A. A. Dorrien-Smith, Tresco.—Seeds and plants, including *Kniphofia* spp., and *Puya alpestris*.
- Messrs. C. Smith & Son, Guernsey.—Plants of *Camellia* spp.
- Major F. C. Stern, Goring-by-Sea.—Miscellaneous collection of plants.
- Mr. E. Sumner, Tamworth.—Herbaceous plants and seeds.
- Messrs. Sutton & Sons Ltd., Slough.—Cuttings of *Penstemon* spp.
- Mr. G. M. Taylor, Longniddry, East Lothian.—A collection of Liliums and Magnolias.
- Mr. A. C. Trott, Tehran.—A large collection of seeds, comprising species of *Berberis*, *Cotoneaster*, *Crataegus*, *Malus*, etc.
- Messrs. Robert Veitch & Son Ltd., Exeter.—Grafts of hardy trees and shrubs.
- Dr. R. S. Wale, Epsom.—A collection of *Sempervivum* spp.
- Messrs. R. Wallace & Co., Ltd., Tunbridge Wells.—Grafts of Rhododendrons.
- Captain G. F. Warre, Roquebrune, A.M., France.—A miscellaneous collection of plants.
- Messrs. J. Waterer, Sons & Crisp Ltd., Bagshot.—Seedling *Aesculus indica*, grafts and seeds of *Quercus Mirbeckii*.
- Mr. R. E. Weaver, St. Margarets Bay, Kent.—A collection of cuttings of stove plants.
- Mr. A. G. Weeks, Limpsfield, Surrey.—Herbaceous and alpine plants.
- Lord Wigram, Windsor Castle.—Plants of *Colletia spinosa*.

### Bedgebury Pinetum

The results of the wet summer of 1936 were very noticeable in the vigorous growth of many trees, and in the luxuriance of the ground vegetation such as bracken, grass, and heather. Many trees added at least two feet to their height and a number of those that were badly injured by the disastrous frost that occurred on the night of May 16–17, 1935, formed new leading shoots. However, the harmful results of that frost have not entirely disappeared, for some of the trees that were killed back into old wood are still very stunted, and although some may form new leading shoots from dormant buds, it is doubtful whether the most enfeebled will recover, and they may have to be replaced. Unfortunately, frost-injured plants are particularly susceptible to further injury by pests. Last spring most of the trees started into growth late, and little harm was caused by spring frosts. Early autumn frost caused some damage, especially to unripened shoots of *Cunninghamia lanceolata* and to several tsugas. In low-lying places 14° of frost were registered on the mornings of October 4th and 9th.



Naturally regenerated trees have grown very fast, and some well placed specimens have been specially labelled in order that they may be compared with planted trees in years to come. Naturally regenerated Scots pine trees are prominent throughout the Pinetum, but there are natural seedlings of many other kinds. In a small protected area the following species of trees and shrubs, all natural seedlings, may be seen growing together:—*Thuja plicata*, *Chamaecyparis Lawsoniana*, *Pseudotsuga Douglasii*, *Pinus sylvestris*, *Abies grandis*, *A. nobilis*, *Picea sitchensis*, *P. Abies*, *Tsuga heterophylla*, *Taxus baccata*, *Ilex Aquifolium*, *Betula verrucosa*, *B. pubescens*, *Quercus Robur*, *Salix* sp., *Rhododendron ponticum*, *Calluna vulgaris*, *Erica cinerea*, *E. Tetralix*, *Cytisus scoparius*. Elsewhere there are additional species. There are numerous seedlings of *Larix decidua*, only one of *Sequoia sempervirens*, but, on the forest plots, a number of *Cryptomeria japonica*.

The gradual pruning of the lower branches of some of the larger-growing species of planted trees has been in progress for four years, and useful information on the progress of healing of wounds made on young trees is now available for those who are studying the effect of pruning on young forest trees.

During May much of the water was siphoned out of Marshall's Lake and several weeks were spent in removing mud deposits. In some places the mud banks were reduced by forty feet.

Lt. Col. F. R. Durham very kindly visited the Pinetum in March for the purpose of advising on the control of flood water in some of the water courses. By following his advice less erosion appears to be taking place in the banks of the streams, and less silt is being carried into Marshall's Lake.

Through the kindness of Sir John Russell, Dr. Crowther and Dr. Richardson visited the Pinetum and investigated certain soil conditions that appear to be causing yellowing in the leaves of some of the trees.

Following the decision of the Pinetum Committee to introduce broad-leaved trees amongst the conifers in order to improve the soil conditions, presentations of maples have been made by Sir John Stirling-Maxwell and by Lord Morley.

By arrangement with Forestry Commission officials a number of specimen conifers and a few well-developed oaks growing near the Pinetum have had their trunks cleared of dead branches and they are to be left as specimen trees when other timber is cut. Some of the conifers are about 70 years old and have clear trunks of from 30 to 40 feet.

In September the Pinetum was visited by about 150 members of the Royal English Forestry Society. They were greatly impressed by the work that is being done in the Pinetum and the Forest Plots, and were enthusiastic about the natural beauty of the site.

Although 1936 appeared to be a particularly wet year, the total rainfall at Bedgebury was 34·28 in. compared with 41·03 in. in 1935. November was the wettest month with 5·20 in. and January had 5·19 in. May was the driest month with ·37 in. The three hottest days were experienced in June, the temperature reaching 83° F. in the shade on June 19th, 84° on June 20th, and 80° on June 21st. The lowest temperature on the ground was recorded on the morning of February 12th when in one low place there were 26° of frost ; on the following morning 25° were registered. On higher ground the temperature was several degrees warmer.

## The Museums

Mr. W. Dallimore, I.S.O., V.M.H., the Keeper, retired under the age-limit at the end of March. He is now living at Bidborough, near Tunbridge Wells, and is continuing to act as Honorary Curator of the National Pinetum at Bedgebury. Dr. J. Hutchinson, Botanist in the Herbarium, was appointed to succeed him, and took up his new duties on April 1st (K.B. 1936, 189).

Routine work connected with correspondence occupied a considerable amount of time as in previous years. The addition of a temporary technical assistant to the staff has been a great help in re-labelling the exhibits. The permanent staff have thus more time for scientific work, including the checking of the valuable Arboretum Herbarium with authenticated specimens.

A start has been made with the revision of genera of economic importance, the first group to be dealt with being the copal gum trees of the tropics, *Copaifera*, etc. The preservation of good herbarium specimens associated with exhibits of economic plants in the Museum cases seems desirable and a Herbarium of Economic Plants has been started ; contributions towards it will be welcomed.

A considerable number of enquiries are received regarding the cause of death of stock, impurities in grain samples, etc., necessitating the identification of seeds, and a small seed collection is being formed to facilitate this work.

Dr. Howes has continued his work on vegetable waxes, and a paper on the subject has been published (K.B. 1936, 503).

Dr. Melville has checked the names of the elms and willows in the living collections, and has named a large number of conifers and other trees sent by correspondents.

Apart from administrative work and new exhibits, the Keeper has been occupied with finishing the work in hand at the time of his transference from the Herbarium staff. This included the determination of Mr. J. Gillett's Somaliland and Abyssinian collection and of his own South African and Rhodesian plants. He has also been responsible for seeing through the press the text of " The Useful Plants of West Africa " which will be published early in 1937.



An important function of the Museums is the dissemination of information with regard to crops, economic and poisonous plants, etc., and the card catalogue of current literature, which was commenced a few years ago, is being enlarged to include earlier references. When finished this should be a valuable repository of information, including a list of common and native names.

Assistants in the Department have continued to serve on the Crude Drugs Sub-Committee of the British Pharmacopæia Commission and on the Empire Minor Forest Products Committee of the Imperial Economic Committee, the body responsible for the recently published "Index of the Minor Forest Products of the British Empire." Assistance has also been given by members of the department in drawing up lists of names of well-known economic plants for conservation.

In Museum 2 a commencement has been made in re-labelling the specimens on the top floor. For large exhibits, cream-coloured, stencilled cards have been prepared.

The cases in the west end of the Annexe of Museum 3 had become badly decayed and have been replaced by larger cases giving much-needed space. As this is the best lighted of the Museums, some new exhibits of general interest have been added, including a fine set of veneers used in decorative work, many of them having been employed in the liner "Queen Mary." These have been presented by Messrs. John Wright (Veneers) Ltd. Two large glass cases have been filled with Dr. I. B. Pole-Evans' photographs of South African vegetation, together with maps and descriptive text of the floral regions. In connexion with this exhibit specimens of everlasting flowers from South Africa have been placed on tables nearby. Into other window-bays where they can be shown to better advantage exhibits of special interest have been moved from the cases in Museum 1. The facade of the large Indian case at the west end of the main building has been temporarily used for a display of pictures of Swiss Alpine plants.

In Museum 4 the specimens on the top floor have been re-labelled and an up-to-date exhibit of the manufacture of tennis rackets from laminated woods has been arranged.

The chief visiting workers during the year were: Dr. Tj. J. Addens (Holland), studying the opium poppy; Mr. G. Komitzer (Palestine), pasture plants; Mr. J. H. Holland (England), overseas plant products; Mr. W. J. Renauf (Guernsey), subtropical fruits.

Presentations to Museums.—Messrs. F. H. Ayres, Ltd., London; examples of the manufacture of tennis rackets.

Mr. P. Bowden, Kew; toy made from seed of *Entada gigas*.

Messrs. Cadbury Brothers, Ltd., Bournville; brazil nuts.

Mr. E. W. Carls, California; specimens of woods.

Messrs. Chivers and Sons, Ltd., Histon, Cambridge; bottled fruits.

- Mr. A. D. Cotton, O.B.E., Kew ; native mat of palm leaves from Nigeria.
- Mr. W. S. Dahl, London ; powders used for plastics.
- Mr. M. T. Dawe, O.B.E., Palestine ; Album of Jaffa Orange Syndicate, Ltd.
- Dr. H. E. Durham, Cambridge ; pieces of mistletoe wood.
- Mr. R. E. P. Dwyer, New Guinea ; fruits of *Parinari laurina* ; fibres.
- Dr. H. G. Fourcade, Witte Els Bosch, S. Africa ; everlasting flowers.
- Mr. J. L. Froggatt, New Guinea ; specimens of timbers.
- Mr. C. W. Hiscocks, Holborn ; Tonkin cane as prepared for golf shafts.
- Dr. F. N. Howes, Kew ; seeds of sweet corn.
- Miss M. W. Hughes, London ; specimen of wood excavated from Roman road.
- Prof. Jaccard, Zurich ; timber specimens.
- Mr. A. Bruce Jackson, Kew ; photographs and herbarium specimens.
- Dr. J. Muir, Riversdale, South Africa ; drift seeds and everlasting flowers.
- Mr. J. B. Paterson, New Zealand ; fruits of " Waratah " (*Telopea speciosissima*).
- Mr. G. A. Peacock, Bath ; timber specimens.
- Sir Albert Seward, F.R.S. ; section of wood of *Sophora japonica*.
- Mr. H. M. Sharpington, West Norwood ; Venesta plywood veneers.
- Mr. J. H. Turner, Kew ; " Cellotex " insulating board.
- Lady Wakehurst, Ardingly ; fruits and lantern slides.
- Messrs. John Wright and Sons (Veneers) Ltd., London ; 62 samples of veneers.
- Duplicate Museum specimens have been distributed to Prof. Holden, Nottingham (specimens of fibres) ; Dr. J. Muir, Riversdale, South Africa (seeds of *Leguminosae*) ; M. Zammit, Malta (samples of woods) ; Mr. A. L. Thorpe, Derby (samples of tea plant) ; Mr. G. A. Peacock, Bath (samples of woods).

### The Jodrell Laboratory

The range of enquiries dealt with and the nature of the material submitted for identification by microscopical means has been as varied as usual. Much of the material consisted of timbers, barks, roots and fibres. The more unusual items included the wood of *Liriodendron tulipifera* (tulip tree) painted black, masquerading as ebony in " antique " furniture ; pith imported from China which proved to be that of a species of *Juncus* ; material clogging up water mains consisting of elm roots ; the contents of the crop of a pigeon which were the underground portions of wood anemones (*Anemone*

*nemorosa*) ; and a " weed " in samples of flax, identified as two species of *Juncus*. Botanical material excavated in Palestine was also identified. Enquiries concerning the storage of seeds and bulbs during transport, the chemical composition of ivy leaves, the growth of roses and carnations in water containing mineral salts, the development of *Opuntia* embryos, and the change in colour of insects caused by the presence of manganese on the plants on which they feed, were also dealt with. All identification work has been greatly facilitated by the reference collection of microscopical preparations which now consists of over 4000 slides.

The researches on the effect of atmospheric pollution, especially on greenhouse plants, have been continued. This work is being carried out in collaboration with H.M. Office of Works, the Government Laboratory, and the General Electric Company, whilst Professor V. H. Blackman, F.R.S., and others interested in the subject have been consulted from time to time. An exhibit showing some of the effects of atmospheric pollution of plants was staged at the Science Museum, South Kensington, during the special exhibition arranged by the National Smoke Abatement Society in October. During the conference of this society, which was held at the same time, a paper was read by the Director giving an account of the work on atmospheric pollution in progress at Kew. So far as greenhouse plants are concerned it has been established that the principal cause of the damage which occurs during foggy weather is the action of the sulphur acids in the atmosphere, which are especially deadly in their effect under suitable conditions of moisture and temperature. Experiments with artificial light to supplement daylight during the winter months are also in progress, but are not yet sufficiently advanced for any conclusions to be drawn.

The work on the morphology and life history of different races of *Ranunculus Ficaria* has been continued, and many interesting points have been discovered. It is hoped that an account of this work will shortly be ready for publication.

Mr. J. Pryde continued his work on the nature of the chemical substances present in a number of different kinds of wood from South Africa. Other visitors to the laboratory included Mr. R. A. Blake-lock (rhizomes), Mr. D. P. Watson (structure and germination of Leguminous seeds), Mr. S. Ramanujam (cytology of rice and related plants), Mr. A. H. Nasr (algae), Mr. J. Bausch (general) and Miss W. M. Curtis (morphology and anatomy of *Taraxacum*).

**DRAWING AND PHOTOGRAPHY.**—A number of type specimens, both Kew sheets and those borrowed from other Herbaria, have been photographed. A certain number of living plants have been photographed or drawn for the Gardens Collection.

A few drawings have been made for " Hooker's Icones Plantarum." Drawings, maps and photographs have also been prepared for inclusion in the new Guide to the Gardens, the Kew Bulletin, and



for Mr. J. D. Snowden's work on sorghums. Enlargements from small photographs made by Dr. Pole-Evans in South Africa, were made for use in the Museums.

In connection with the work at the Potterne Biological Station photographs and drawings, some in colour, have been made of *Silene*, *Anagallis*, *Epilobium* and *Centaurea*, and drawings and diagrams in collaboration with Dr. Metcalfe have also been made of the bulbils of *Ranunculus Ficaria*. In many specimens the structure was so complex that it was necessary to construct plasticine models from the serial sections before making the diagrams.

Assistance was given to Mr. A. Farghaly, Faculty of Agriculture, Giza, Egypt, in illustrating a paper on the anatomy of *Zilla spinosa* which he was preparing for publication. Visitors who have worked in the Studio or who have received some assistance included: Mrs. M. E. Wilson (London), Mrs. H. N. Moldenke (New York), Mr. C. G. Trapnell (Northern Rhodesia) and Dr. G. A. C. Herklots (Hong Kong).

### The Marianne North Gallery

During the past year all the pictures painted by Miss Marianne North in many parts of the world have been rebacked with sheets of 3-ply wood. The back boards have been hermetically sealed in and the whole painted over to prevent ingress of dust and acid fumes from the atmosphere. The glass has been carefully cleaned and the pictures now appear as bright and fresh as when first painted.

When the pictures were framed and hung by Miss North they were not covered with glass and for eleven years they remained fully exposed to atmospheric conditions. Moreover, there was no wooden panelling at the back to protect them from dampness.

During the winter 1893-94, under the advice of Sir Frederick Leighton, then President of the Royal Academy, the walls of the gallery were lined with matchboard, and the pictures were varnished and backed by two or three pieces of closely fitting pine-boards and papered over, (see K.B. 1894, 165). Last year as some of the pictures appeared rather dull, the President of the Royal Academy very kindly visited the Gallery. It was then found that the acids in the atmosphere had penetrated through the paper covering the joints between the pine and wood boards and had made yellow bands on the backs of the cardboards on which the pictures are painted. This yellowing, though at the moment not a serious injury, might easily have become so. The President therefore recommended that the pictures should each be backed with a continuous sheet of plywood completely filling the back of the picture frame to prevent any ingress of air in the future. The cardboards of each picture have been treated with a solution of formalin and carefully sealed into their frames. The work was

entrusted to Messrs. James Bourlet and Sons, Ltd., of Mortimer Street, W.1. It has been carried out most efficiently and it is hoped that this valuable collection is now safe from any injury for all time.

As all the pictures had to be taken down from the walls, the opportunity has been taken to clean and restore thoroughly Miss North's decorations of the walls and upper gallery, and her panel paintings on the doors and the walls of the upper gallery. The ceiling has also been colour-washed in harmony with the wall decoration. The pitch-pine panelling of the interior of the Porch has been painted cream-colour, which makes the entrance to the Gallery far more attractive, and the doors have been repainted in colours in harmony with the Gallery decorations instead of the dull blackish-grey colour formerly employed. The electric lighting has also been modernized.

### The Herbarium

#### EUROPE, NORTH AFRICA, AND THE ORIENT.

15,880 numbers have been received for incorporation in this department of the Herbarium. This figure includes 8802 numbers received for identification or verification, but does not include single specimens or small parcels sent for determination. 11,201 sheets have been mounted and laid in.

Additions to the collections from the British Isles have been made by members of the Kew staff from Cornwall, Devon, Dorset, Norfolk, Suffolk, Lancashire, and the Irish Free State. Miscellaneous British collections were received from: Mr. G. H. Allison, Dr. N. L. Bor, the Botanical Society and Exchange Club of the British Isles, Mrs. V. Dickson, Miss M. E. Edmonds, Mr. P. M. Hall, Prof. J. W. Heslop-Harrison, Mr. H. B. Johnston, Miss M. D. Ker, Rev. F. H. W. Kerr, Mr. J. E. Lousley, Mr. F. K. Makins, Mr. G. E. Martindale, Mrs. L. Matthews, Mr. H. S. Redgrove, Mr. H. N. Ridley, Mrs. C. I. Sandwith, Mr. J. Sinclair, Mr. H. S. Thompson, Mr. C. H. Wright, and Mr. J. W. Wyatt.

Twenty specimens of *Taraxaca* from Ireland and Wales were presented by the Botanical Museum, Lund, and included newly described apomicts. Miss Thurston presented 388 specimens and three manuscript books, catalogues, and notes of Cornish plants, inherited from her brother, the late Mr. Edgar Thurston (see Kew Bull. 1935, 594).

Mr. E. Nemes has rearranged the entire collection of *Carex* according to Kükenthal's Monograph, and has also prepared a typed Index of the genus which contains 4,000 accepted names and synonyms. In addition, he presented to Kew over 500 specimens of British *Carices* collected by him during 1936. These have been exchanged with institutions specially interested in the *Cyperaceae*,

chiefly the Botaniska Museum, Uppsala ; the Botanical Institute, Academy of Sciences, Leningrad ; and the Botanical Institute, Hokkaidô Imperial University, Sapporo, Japan.

Important collections of plants (totalling over 1,570 numbers) from the Balkan Peninsula have been received during 1936. These include Greece (the late Mr. S. C. Atchley, see Kew Bull. 1936, 336) ; Albania (Dr. F. Lemperg and Mrs. R. V. Pennington) ; N. Macedonia (Dr. P. L. Giuseppi) ; Thrace (Mr. H. G. Tedd) ; Bosnia and Hercegovina (Dr. K. Maly, Landesmuseum, Sarajevo) ; and S. Croatia (Rev. and Mrs. H. P. Thompson). A collection of Serbian plants was purchased from Dr. F. Lemperg, and plants of Thessaly, Athos Peninsula, and N. Macedonia from Mr. O. S. Grebenchikoff.

Collections from the Iberian Peninsula and Balearic Islands have been received from the Museum and Botanic Garden, Geneva ; Mrs. E. W. Moore Kennedy ; Mr. G. E. Martindale ; Mr. H. Phillips ; and Dr. R. Seligman ; and cent. 2 and 3 of *Flora Iberica Selecta* have been purchased from Dr. P. Font Quer.

Central and N. European plants have been contributed by Miss C. A. Cooper ; Mr. D. Fanshawe ; Mr. E. Hodgkin ; Mr. J. W. Wyatt ; Dr. F. J. Widder (Austria) ; Cluj University (*Flora Romaniae Exsiccata*, cent. 12-14) ; Masaryk University (*Flora Exsiccata Reipublicae Bohemicae Slovenicae*, cent. 11) ; Miss Ann Conolly (French plants) ; and Messrs. J. E. Lousley and F. Rilstone (miscellaneous European plants). *Plantae Poloniae Exsiccatae* cent. 2 was purchased from the Botanic Gardens, Cracow.

A valuable collection of Dutch plants was received from the Rijks Herbarium, Leiden. These will help to fill a considerable gap in the representation of European plants in the Herbarium. Bds. 1-6 of the "Most important agricultural cultivated plants with their weed seeds" was purchased from the Hamburgisches Staatsinstitut für angewandte Botanik.

Oriental plants were received from the Botanic Garden and Museum, Berlin (*Manisadjan*, *Plantae Orientales* and *Reliquiae Manisadjanae*) ; Rev. H. E. J. Biggs, Miss E. Daly and Mr. A. C. Trott (plants of Iran) ; Field Museum, Chicago (plants of Iran and Iraq) ; Miss L. Trotter (Persian plants) ; Mrs. V. Dickson (Arabian plants) ; Mr. J. Fernandez (plants of Bahrein Islands) ; Major W. R. Hay (plants of Afghanistan) ; Dr. A. Eig and Mr. H. B. Johnston (plants of Palestine) ; U.S.S.R. Academy of Sciences, Baku (Transcaucasian plants). Valuable collections from Cyprus (made by Mr. A. Syngrossides) were received from the Department of Agriculture, Cyprus, and also from Mrs. M. E. Dray.

A large collection of specimens from Antalya, Turkey, was purchased from Dr. T. A. Tengwall, and Plants of the Petra District and Hauran from Mr. J. Dinsmore.

A collection of about 100 specimens from the country behind Aden was received from Mr. R. C. Maxwell Darling, and contained



several little-known species. Collections made by Mr. E. K. Balls and Mr. A. W. Trethewy in Morocco and by Mr. C. H. Wyatt in Tunisia, which have been presented during the year, have added to our still very incomplete representation of the North African flora. The purchase of series 2-5 of *Exsiccata des Plantes Endémiques et Rarissimes du Maroc* from Mr. J. Gattefosse has been a further help in this direction.

Miss D. A. Chaytor kindly gave her services for a part of the year. She assisted in general routine work and continued her studies on the cultivated lavenders.

Mr. R. A. Blakelock has rendered valuable voluntary assistance during the year in general herbarium routine and in re-arranging the genus *Cytisus*. Mr. D. P. Fanshawe has given great help for two months in naming Central European and other collections.

Miss W. M. Curtis is continuing her research on the anatomy and development of British and other *Taraxaca*, utilizing the material being grown in the Herbarium Experimental Ground.

*Publications*.—Additions to the Flora of Cyprus: II (K.B. 1936, 16).

The Flora of the Pyrénées Orientales. New varieties and additions (K.B. 1936, 95).

On the Flora of the Nearer East: XVII (K.B. 1936, 100).

The History of Rheum Rhaponticum L. (Bull. Soc. Bot. Bulg. 7, 23: 1936).

Notes on the Genus *Sempervivum* (Bull. Soc. Bot. Bulg. 7, 124: 1936).

## ASIA.

INDO-MALAYA.—The "Flora of the Presidency of Madras" was completed by the publication early in February of Part 11, consisting mainly of the addenda, corrections and general index. A considerable number of sheets, partly current receipts and partly accumulated arrears, have been mounted and laid in during the year. A large quantity of accumulated material still remains to be dealt with.

Professor E. Barnes continued his investigations into the flora of S. India and again sent useful notes and valuable specimens to the Herbarium. Several of the plants have been found to be novelties.

The collection made in Tibet and Sikkim by Messrs. C. S. Cutting and A. S. Vernay, referred to in last year's report, was worked through. It proved of unusual interest, since it included 9 new species; an account will be published shortly in the Bulletin. The examination of the collections made by Capt. F. Kingdon Ward in Assam in 1928 and by Mrs. N. E. Parry in the Garo Hills in 1928-1930 was completed. The former contained several new species.

Dr. N. L. Bor of the Indian Forest Service spent several months at Kew working on the grasses which form part of a large collection made by himself in Assam, mainly in the Naga Hills. Work on the collection is being continued by the Botanist for India and it will certainly add greatly to our knowledge of the flora of that region. Mr. H. K. Nandi presented a number of specimens found by himself in Assam, principally in the Khasia Hills. This collection is being dealt with in conjunction with that of Dr. Bor. Smaller collections were received from the Rev. W. J. L. Wenger from the Chittagong Hill tracts, from Mr. R. N. Parker, collected in the Punjab, and from the Forest Research Institute, Dehra Dun.

Dr. A. F. G. Kerr and Mr. H. B. Garrett contributed interesting plants from Siam. The Singapore Botanic Gardens again presented a considerable number of named sheets and valuable material was also supplied by the Malay States Forest Research Institute, Kepong.

The Forest Department, British North Borneo, continued to send collections; the identification of the material received up to the end of 1935 has been continued to the end of the *Polypetalae*. The naming of the collection made by the Oxford University Expedition to Sarawak in 1932 is now almost complete, and it is hoped that outstanding novelties will be described and the duplicates distributed within the next six months.

About 400 named duplicates, including 150 specimens of cultivated palms, were presented by the Botanic Gardens, Buitenzorg, and 440 by the Bureau of Science, Manila. 120 specimens of Celebes plants were received from the Botanic Garden and Museum, Berlin, and a similar number from the National Museum of Natural History, Paris.

Miss M. M. Whiting once more gave voluntary service in sorting and re-arranging the collections in the Indo-Malayan region, particularly in separating the different sections, in establishing the type specimens and in naming material according to recent revisions.

*Publications*.—Contributions to the Flora of Borneo and other Malay Islands: V (K.B. 1936, 17).

Contributions to the Flora of Siam: XL (K.B. 1936, 34).

The anatomy of some Lauraceous scent-yielding woods known as "Medang", by B. Alwyn Jay (K.B. 1936, 66).

New or little-known plants from S. India: VII (K.B. 1936, 274).

Plants new to Assam: VIII (K.B. 1936, 280).

A Note on the Himalayan *Daphnes* (K.B. 1936, 433).

Notes on the Genus *Schima* and on the Classification of the Theaceae-Camellioideae (K.B. 1936, 496).

CHINA, JAPAN AND NORTHERN AND CENTRAL ASIA.—The most important collections received during the year were two sets of specimens from the Island of Hainan. One, of 1008 specimens, was collected on the 4th Hainan Expedition of the New York Botanical Garden, and was presented by that Institution; the

other consisted of 930 specimens collected on the 6th Hainan Expedition, presented by the Bentham-Moxon Trustees. These, together with the extensive collections from the island received from former expeditions (the 2nd and 3rd sent out by the New York Botanical Garden) will render the flora of that island better represented at Kew than that of almost any other part of South China.

The following specimens were also presented :—A set of named Chinese rhododendrons by Lord Aberconway ; a collection of Yunnan plants by Mrs. A. Grist ; flowering plants and *Carices* of Central Asia by the U.S.S.R. Academy of Sciences, Leningrad ; and specimens of *Eremurus* by Dr. A. Vvedensky.

*Research.*—A revision of the Chinese species of *Gentiana*, comprising an enumeration and key of 184 species with numerous varieties, is now in proof, together with two other papers on the genus, *viz.* "New Chinese species of *Gentiana*" described by Dr. H. Smith, and "Contributions to the Gentian Flora of Southern Tibet, N.E. Burma and Bhutan", including the descriptions of a number of new species.

## AFRICA.

Owing to Dr. J. Hutchinson's appointment to the Keepership of the Museums only one Botanist and two Assistant Botanists have been working on Tropical African plants during the greater part of the year. The work of naming incoming collections has occupied the greater part of official time, but the maintenance of the herbarium and the writing-up of genera by recent revisions has not been neglected. The African species of the genera *Achyrosperrum* Blume (*Labiatae*), *Pseuderanthemum* Radlk. and *Ruspolia* Lindau (*Acanthaceae*) were revised, several miscellaneous new species were described and notes as to little-known or misunderstood species were published. Work on the genus *Ammocharis* Herb. (*Amaryllidaceae*) in collaboration with Dr. H. G. Schweickardt has continued.

WEST TROPICAL AFRICA.—With the "Flora of West Tropical Africa" now completed it is possible to see how imperfect is still the state of our knowledge of the flowering plants of certain parts of the Territory. Collections received during the year from the Gold Coast and from Nigeria contain species, not only new to the West African floristic area, but new to science. Well-preserved collections with accurate observations will be welcomed from the interior of any of the West African Colonies. In particular specimens of succulent plants such as *Aloë* and certain *Euphorbia* species, and members of the *Asclepiadaceae* are required. Information as to the best method of preserving these plants will be given on request.

Dr. A. Chevalier has presented a valuable set of named duplicates of specimens collected by him in Cape Verde Islands. Mr.



F. C. Deighton has continued to send specimens, accompanied by most useful notes, of Sierra Leone plants, about 200 having been received through the Department of Agriculture. Dr. F. R. Irvine presented a further 250 specimens from the Gold Coast and nearly 100 specimens were received from the Gold Coast Forestry Department, mainly collected by Mr. C. Vigne and Mr. J. E. Andoh. Mr. C. S. Cansdale presented a small collection, mainly of terrestrial orchids, from the Northern Territories, which proved to be of special interest. A few Nigerian specimens were received from Mr. I. D. Hepburn, and about 130 from Mr. R. J. Newberry. The Imperial Forestry Institute contributed some named duplicates from Nigeria and from the Gold Coast.

CAMEROONS AND CONGO.—About 900 named specimens were received in exchange from the Botanic Garden, Brussels. These are mainly plants collected by Dr. W. Robyns in the Belgian Congo, and form a valuable addition to our Congo collections which are still very weak. The Gray Herbarium also forwarded some specimens from the Belgian Congo.

NORTH-EAST TROPICAL AFRICA.—Two valuable collections were received from the Department of Agriculture, Uganda, collected on the Imatong Mountains in the southern Anglo-Egyptian Sudan (360 specimens collected by Mr. A. S. Thomas, and over 100 by Mr. H. B. Johnston). They should add very considerably to our knowledge of the flora of these mountains, which form such an important link in the chain of distribution of the montane flora of Tropical Africa. Major G. Aylmer presented about 300 named specimens, mainly from the forests of the southern Sudan. Mr. F. W. Andrews contributed a further collection of about 100 specimens, including a number of water-plants preserved in spirit, from the Blue Nile Province. Some of these were species not previously recorded from the territory. Collections of a similar nature from this and other territories would add greatly to our knowledge of this neglected group of plants. The determination of Mr. J. B. Gillett's Somaliland collection is now practically completed.

EAST TROPICAL AFRICA.—Some exceptionally fine collections have been received from this area during the year. Although the proposed "Flora of British East Africa" still awaits official sanction, it is important to acquire good collections from East Africa in advance, and help in this direction from any interested persons willing to collect will be welcome.

UGANDA.—A collection of over 600 specimens was purchased from Mr. W. J. Eggeling, who made a private expedition through the little-known north-eastern parts of the Protectorate. This has added many new records to the Uganda flora, and has em-

phasized the need for collections from the more remote parts of East Africa. In the genus *Acacia*, to take one example, Mr. Eggeling made 14 gatherings, representing 9 species. Of these, two are unrecognized and are probably undescribed species, five are species previously unrecorded from the Protectorate, one was known only from the north-west corner of Uganda, and the remaining species had been recorded only once before. Mr. Eggeling has, in addition, forwarded to Kew, either personally or through the Forestry Department, over 300 specimens, including a number of interesting orchids, and 20 other specimens collected by Mr. R. G. Sangster were received from the Conservator of Forests. Mr. H. B. Johnston presented over 100 specimens from Uganda and the adjacent parts of the Belgian Congo. Thanks are also due to the Officers of the Uganda Department of Agriculture who collect with skill and continue to show much enthusiasm, fine consignments having been received from that Department collected by Messrs. P. Chandler, G. L. R. Hancock, A. S. Thomas, and C. Hazel, amounting to several hundred numbers. A large collection was also received from Mr. A. P. G. Michelmores, and Miss D. C. Mainwaring presented a small but interesting collection of Uganda and Kenya plants. There is still much collecting to be done in Uganda, and certain groups, such as succulents and water-plants, are badly represented.

*Kenya*.—Over 100 specimens were received from the Forestry Department, including collections from the coastal forests and from the Cherangani Mountains, whilst the Department of Agriculture sent a similar number for identification. Collections from the dry northern parts of the Colony were received from Messrs. A. M. Champion, C. Maher and H. B. Johnston, who also made a small collection in the adjacent territory of Italian Somaliland. We greatly miss the receipt of the good collections from the Coryndon Memorial Museum at Nairobi, which have been sent to Kew during past years.

*Tanganyika*.—Mr. B. D. Burtt of the Department of Tsetse Research has sent about 700 very fine specimens collected in various parts of the Territory. Their value is greatly increased by the ample material provided, thus making it possible to distribute duplicates of rare or little-known plants to African and continental herbaria. Messrs. C. H. N. Jackson and H. M. Lloyd of the Department of Tsetse Research also forwarded small but interesting collections through Mr. Burtt. From the Department of Agriculture nearly 400 specimens were received, collected by Mr. H. Gillman in the Bukoba District and by Mr. N. V. Rounce. Mr. P. J. Greenway, Botanist at the East African Agricultural Research Station, Amani, sent for identification over 900 specimens, more than 400 of which were collected by himself. An interesting collection, mainly from the little-known Ufipa District, was received from Mr. A. P. G. Michelmores. Other collections were received from Mrs. G. A.

Chambers, Dr. and Mrs. A. T. Culwick, and Mr. R. G. Turrall. About 70 named duplicates were presented by the Imperial Forestry Institute.

From Zanzibar a few orchids were received from Mrs. T. C. Vaughan, and some named specimens from the Imperial Forestry Institute.

SOUTH TROPICAL AFRICA.—Comparatively little came from this area during the year. Sr. A. de F. Gomes e Sousa has presented about 220 very acceptable specimens from the neighbourhood of Inhambane, Portuguese East Africa ; Mr. F. Eyles has sent a further 170 specimens from Southern Rhodesia. Duplicates of Nyasaland plants were presented by the Imperial Forestry Institute, and the Nyasaland Department of Agriculture sent about 40 specimens, including rices and grasses, for naming. Two small collections came from Northern Rhodesia ; about 30 specimens from Captain K. R. Paterson collected on his farm in the Mwinilunga District, and 100 specimens from Fort Jameson collected by Mrs. M. G. Winterbottom.

#### SOUTH AFRICA.

Revisions of the South African material of the genera *Tribulus* L., *Brachylaena* R. Br. (by Dr. H. G. Schweickerdt in collaboration with Dr. E. P. Phillips, Pretoria) and *Helictotrichon* Bess. ex Schultes have been completed, and the MS. has been despatched to Pretoria for publication. In addition Dr. Schweickerdt has continued his researches on South African *Gramineae* (see p. 568), and, in collaboration with Mr. E. Milne-Redhead, on the genus *Ammocharis* Herb. An account of " Newly Recorded Genera of South African Plants " has been completed and is due to appear in the next volume of the " South African Journal of Science."

Miss H. Forbes (see p. 533) of the Natal Herbarium, Durban, the second Assistant seconded for duty at Kew from South Africa, arrived at Kew towards the end of June and is undertaking a revision of the South African species of *Tephrosia* Pers.

During the course of the year 1153 specimens from South Africa were named, and 3904 specimens were incorporated in the herbarium.

A fine collection made by Dr. K. Dinter in South-West Africa, consisting of nearly 1000 numbers, was purchased. About 60 specimens were received for identification from the McGregor Museum, Kimberley, and a small collection of *Aristida* and *Tephrosia* from the Orange Free State University College, Bloemfontein, whilst some 200 named duplicates were received from the Natal Herbarium and a few from the Transvaal Museum. As usual, the National Herbarium, Pretoria, contributed a large number of specimens, partly named, partly for identification, over 1200 being

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received during the year. Of these a set of 50 *Aloë* species collected by Mr. G. W. Reynolds is of special interest. Prof. R. S. Adamson, Dr. H. G. Fourcade, Mr. N. S. Pillans and Captain T. M. Salter presented fine named collections of Cape plants, whilst Mr. F. R. Long of Port Elizabeth forwarded 100 specimens for identification. From the Botanic Garden and Museum, Berlin, 30 specimens of Schlechter's South African *Asclepiadaceae* were received.

The investigation of the genus *Scabiosa* in tropical and southern Africa has been continued by Mr. B. L. Burtt and the Director, with the aid of specimens sent on loan by various institutions. The work is now nearing completion and it is hoped to publish a paper embodying the results during the coming year.

*Publications.*—*Achyrospermum* in Tropical Africa (K.B. 1936, 47).

New and Noteworthy South African Plants : VIII, by J. Burtt Davy and J. Hutchinson (K.B. 1936, 80).

*Mundulea* Fish Poison, by P. J. Greenway (K.B. 1936, 245).

*Eranthemum* of the "Flora of Tropical Africa" (K.B. 1936, 255).

The Cultivation of *Hydnocarpus Wightianus* in Nigeria, by J. D. Kennedy (K.B. 1936, 341).

Tropical African Plants : XIV (K.B. 1936, 469).

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#### AMERICA.

During 1936, about 9700 sheets have been mounted and 5500 have been incorporated, a satisfactory increase on the numbers of the previous year. Two collections from British Guiana were dealt with, one made by the Forest Department on the Upper Demerara River, and the other by the entomologist Mr. J. G. Myers in the far interior of the Colony ; both were of great interest and contained material of trees new to science. In addition, a third consignment was received from the Department of Agriculture for naming, consisting mainly of old specimens from the Jenman Herbarium, Georgetown. A portion of typescript for the "Flora of Trinidad and Tobago," completing the account of the *Calyciflorae*, was carefully examined, and was later discussed with Prof. E. E. Cheesman, who, with Mr. Nigel Wright, Lecturer in Botany at the Imperial College of Tropical Agriculture, is continuing the preparation of the Flora in co-operation with Kew. A valuable acquisition from Trinidad was the purchase from his executors of the personal collections, botanical registers, and other papers of the late Mr. W. E. Broadway. The collections amount to nearly 1000 numbers

which have been checked and incorporated, or distributed as duplicates, with the help of Mr. R. E. Dean, now Curator of the Royal Botanic Garden, Trinidad.

Mr. G. B. Hinton has continued to send remarkably fine series of specimens from Central Mexico, and a member of the staff is permanently occupied in dealing with these collections, which have now reached nearly 10,000 numbers.

A considerable amount of time has been spent in the preparation of an account of the *Bignoniaceae* of Surinam for Dr. A. Pulle's Flora of that Colony. Other special investigations were a thorough study of the Mexican species of *Bursera*, which was undertaken for the purpose of naming Mr. Hinton's extensive material; and the examination of 87 gatherings of tropical American *Strychnos* received from the New York Botanical Garden. A few large genera were re-arranged, notably *Cayaponia*, *Forsteronia*, *Odontadenia* and *Mandevilla*.

Among other collections determined during the year were three from North America, received during 1935, made by Miss M. M. Whiting (Canada), Rev. and Mrs. H. A. Turner (Baffin Land) and Mr. C. W. Thornton (Alaska); a collection from Bolivia, made by Mr. G. E. Wolstenholme; and an interesting set of Argentine plants sent by Dr. A. Burkart, during 1936, was also named.

The following collections were also received:—

N. AMERICA.—*Presented*: By the National Herbarium of Canada, Ottawa (a large number of specimens, mainly from the eastern arctic regions); University of Florida Agricultural Experimental Station (further specimens of *Zephyranthes*); Imperial Forestry Institute, Oxford (North American Asters); by the University of California, Berkeley (Californian plants); Gray Herbarium (*Plantae Exsiccatae Grayanae*, cent. 6, and plants of Virginia); Dr. F. A. Rodway, Nowra, New South Wales (Californian plants, coll. L. S. Rose); Stanford University (plants of California and Oregon); U.S. National Museum, Washington (plants of United States and Florida).

CENTRAL AMERICA.—*Presented*: By the U.S. National Museum, Washington (collection of flowering plants and ferns from Oaxaca, Mexico, and other Central American plants). *Purchased*: Mr. H. Scott Gentry (the Rio Mayo District of Mexico); Mr. C. L. Lundell and Mr. W. A. Schipp (British Honduras); Dr. A. F. Skutch (Costa Rica).

WEST INDIES.—*Presented*: By the Empire Cotton Growing Corporation (interspecific hybrids of *Gossypium*); Gray Herbarium (Cuba). *Purchased*: Rijks Museum, Stockholm (Haiti and San Domingo, coll. Dr. E. L. Ekman).

EAST TROPICAL S. AMERICA.—*Presented* : By the Rijks Museum, Stockholm (Brazil, coll. P. Dusén) ; U.S. National Museum, Washington (miscellaneous specimens) ; Botanical Museum, Utrecht (Surinam).

WEST TROPICAL S. AMERICA.—*Presented* : By the University of California (Peru, coll. Mrs. Ynes Mexia) and U.S. National Museum, Washington (Peru and Ecuador). *Purchased* : University of California (Brazil and Peru, coll. Mrs. Ynes Mexia) ; U.S. National Museum, Washington (Peru, coll. Mr. G. Klug).

TEMPERATE S. AMERICA.—*Presented* : By Dr. F. Felippone (Uruguay) ; Museum and Botanic Gardens, Geneva (miscellaneous American plants).

*Publications*.—Contributions to the Flora of Tropical America : XXV–XXVIII—Species novae vel minus cognitae mexicanae Hintonianae (K.B. 1936, 1 and 387).

Notes on the Mexican species of the genus *Bursera* (K.B. 1936, 346).

The genus *Tovomita* in British Guiana (K.B. 1936, 210).

Notes on an Expedition to the Rupununi District, British Guiana, by T. A. W. Davis (K.B. 1936, 526).

#### AUSTRALIA AND NEW GUINEA.

Much time has been spent in replying to queries and in naming small collections, but good progress has been made in the determination of Mr. C. E. Hubbard's large Queensland collection, and thanks to the voluntary assistance again kindly given by Miss M. D. Ker it has been possible to make a further distribution of duplicates. In the early part of the year Dr. W. E. Blackall continued his work on his Western Australian plants. Valuable collections were received from Mr. J. M. Black (Adelaide), Mr. C. T. White (Brisbane Botanical Museum), Dr. F. A. Rodway (New South Wales), the National Herbarium, Sydney, and the Department of Agriculture, Western Australia. Collections were also received for naming from Mr. E. Ashby (S. Australia) and from the North Queensland Naturalists Club.

Continued consignments of Papuan plants presented by the Bentham-Moxon Trustees, were received from Mr. C. E. Carr until his death in the summer ; these numbered over 3000 gatherings during the current year.

Good progress is being made in the mounting of Australian plants in the stores and it is hoped that the greater part of these will be incorporated in the Herbarium during the coming year.



## NEW ZEALAND.

Only routine questions and small collections have been dealt with. A number of selected specimens of newly described or rare species have been received from Dr. H. H. Allan, which are valuable additions to the collections.

## OCEANIA.

Several small collections from various island groups have been named, including one of Gilbert Island plants from Mr. H. E. Maude; further specimens will be welcome from this region. Collections have been received from the following:—Bernice P. Bishop Museum, Hawaii, and Field Museum, Chicago (Hawaian Plants); Kyushu Imperial University, Japan (Plants from Micronesian Islands) and the New York Botanical Garden (Fiji plants collected by Dr. A. C. Smith). A small collection of Bougainville Island plants was purchased from the Rev. A. H. Voyce.

*Research.*—Work on the specimens of *Ficus* collected in Fiji by Dr. A. C. Smith was completed and the manuscript has been sent to Dr. Smith for inclusion in the general account of his Fiji plants. Figs from many other groups have also been studied and it is hoped to prepare accounts of several other collections for publication shortly.

*Publications.*—Melanesian Plants: II (K.B. 1936, 459).

On the Systematic Position of the Genus *Dolianthus* C. H. Wright, by C. E. B. Bremekamp (K.B. 1936, 103).

## ORCHIDACEAE

The routine work has included the naming of collections from all parts of the world, and of living plants from the Gardens. This latter work will serve as a basis for the preparation of a new edition of the Orchid Handlist.

During the year Mr. H. N. Ridley presented his large and valuable collection of drawings of orchids, principally those of Malaya and of the Malay Peninsula. It includes drawings of the types of many of his new species and is the most complete collection in existence of drawings of Malay Peninsula orchids. The collection, which consists of over 1000 drawings, many of them coloured, is being written up and it is hoped to incorporate it early next year (see also under section "Illustrations and Portraits").

About 70 orchids collected in France were presented by Dr. A. F. G. Kerr.

*Research.*—The outstanding species remaining from work on the "Flora of West Tropical Africa" were described and published

during the year. The account of the orchids of the Swedish Expedition to Southern Rhodesia is almost completed and will be published in Sweden with the accounts of other collections of the expedition. Research is still being continued on African orchids, particularly the genus *Habenaria* and various Angraecoid genera, and also on the orchids of Burma, Siam and the neighbouring regions.

Messrs. T. Tang and F. T. Wang continued their work on the orchids of China and Japan.

*Publication*.—African Orchids : VIII (K.B. 1936, 221).

#### GRAMINEAE.

As in 1935, a large number of valuable collections were received from many parts of the world. Those from Africa, especially from east and south-tropical, once again have been the most numerous. Almost every collection, and noticeably those from the mountains of East Africa, included specimens of little-known or rare species. Amongst the more important of those collections which were entirely composed of grasses special mention may be made of the following :—About 1000 specimens of North Indian grasses collected by the late Col. G. Wingate and presented by his daughter, Miss R. O. Wingate ; several hundred grasses from Assam, Singapore, Hong Kong and Honolulu, from Dr. N. L. Bor ; Queensland grasses from Mr. C. T. White, Brisbane and Mr. S. T. Blake, Brisbane ; 64 Australian grasses from the National Herbarium, Melbourne ; a few specimens from the Hoggar Mountains, Central Sahara, presented by Dr. R. Maire ; a small collection of grasses from the Imatong Mtns., Sudan, collected by Mr. H. B. Johnston ; a very important collection of over 500 specimens from the neighbourhood of Zomba, Nyasaland, collected by Mr. A. B. Cormack ; Northern Rhodesian grasses from Miss L. M. Seaton, Broken Hill ; S. Rhodesian and S. African grasses from the Botanical Museum, Lund ; South-West African grasses collected by Dr. G. Boss ; Seychelles grasses from Mr. F. L. Squibbs ; 240 Central and South American grasses from the United States Department of Agriculture, Washington, including co-types of several new genera and species ; 24 Argentine grasses from Professor L. R. Parodi ; 139 specimens of U.S.S.R. grasses from the Academy of Sciences, Leningrad, including syntypes or authenticated specimens of many species described in recent years by Russian botanists. Collections of seed and/or specimens of several cereals (*Oryza*, *Sorghum* and *Pennisetum*) have been received from the Departments of Agriculture in N.S.Wales, Gold Coast and Gambia, and from Mr. R. E. Massey, Sudan.

The preparation of vol. 10 of the "Flora of Tropical Africa" has been continued. The first part, containing the account of the

genera of the *Arundinelleae*, *Aveneae*, *Arundineae* and *Agrosteae*, is in the press and should be published early in 1937. It has not been possible to spend much time on the study of Australian grasses, but a revision of the genus *Ectrosia* and an account of the new genus *Thaumastochloa* have appeared in "Hooker's Icones Plantarum." Several interesting new genera of African grasses have been described in the "Kew Bulletin" (*Hypseochoa*, *Oryzidium*, *Phaenanthoecium*) and "Hooker's Icones Plantarum" (*Cymbosetaria*, *Apochiton*). The account of the genus *Apochiton* also included a key to and an enumeration of the genera of the *Eragrosteae*. A revision of the South African species of *Helictotrichon* (*Avenastrum*) has been prepared by Dr. H. G. Schweickerdt and will appear in the next part of "Bothalia." The South African material of *Aristida*, amounting to several thousand sheets, has been received on loan from the more important herbaria in South Africa. It is being critically examined and compared with authentic specimens by Dr. Schweickerdt. In addition to the research mentioned above, several thousand determinations have been made and 2,170 sheets of grasses laid-in in the Herbarium.

Dr. N. L. Bor spent several months studying Assam grasses in order to prepare an account of the *Gramineae* for the "Flora of Assam." Mr. R. E. Vaughan was engaged for some time in examining specimens from Mauritius, for a paper on the grasses of that island. Mr. J. D. Snowden completed his monograph of the "Cultivated Races of Sorghum," and his volume on the subject was published in May. He was good enough to give voluntary help in naming various collections of sorghums received in the early part of the year, and in the revision of the Uganda material of several genera for a manual of the grasses of that country.

*Publications.*—The Cultivated Races of Sorghum, by J. D. Snowden. (Published by the Bentham-Moxon Trustees).

Some Uncommon British Grasses (Proc. Linn. Soc. 1935-36, 108).

*Spartina Townsendii* and *S. brasiliensis* in Warm Countries, by J. Bryce (K.B. 1936, 21).

Two New Arundinarias from Yunnan, by Y. L. Keng (K.B. 1936, 106).

The Bamboo Genera, *Dinochloa* and *Melocalamus*, by F. A. McClure (K.B. 1936, 251).

Notes on African Grasses : XIX (K.B. 1936, 293).

Notes on African Grasses : XX (K.B. 1936, 500).

#### PTERIDOPHYTA.

Work on the new edition of the "Handlist of Ferns in cultivation at Kew" has been carried on systematically throughout the year.



This has involved a great deal of taxonomic and nomenclatural study, since it was considered desirable to check the name of every specimen listed from the Gardens. Many identifications have been corrected, and many nomenclatural changes have been found necessary in order to bring the list into line with C. Christensen's "Index Filicum." Two specimens of every species represented are being dried and mounted to form reference sets. One of these sets will be kept in the Ferneries and the other will be placed in a special cabinet in the Herbarium. Such a reference collection will be of value in connection both with enquiries as to cultivated specimens and with the acquisition of new material.

The following collections were received at the Herbarium during the year : 142 specimens of ferns collected in St. Vincent, presented by Mr. E. C. Phillips ; 400 mounted sheets of cultivated ferns collected and presented by Mr. C. H. Curtis ; 860 sheets of ferns from the N.W. Himalayas, mainly from the herbarium of Mr. T. Bliss, presented by Mrs. G. Belcham ; a collection of Jamaican ferns collected by Capt. W. S. Close, presented by his daughter Miss M. Close.

During the year, 1,500 sheets were incorporated, while the large number still to be laid in have been sorted into genera and arranged in separate cabinets.

#### MUSCI, HEPATICAE AND CHAROPHYTA.

The third and fourth series of *Musci Selecti et Critici* and the ninth and tenth series of *Hepaticae Selectae et Criticae* issued by Dr. Fr. Verdoorn have been purchased. Other purchases include Costa Rican mosses from Dr. A. F. Skutch, and Aleutian Island mosses from Mr. W. J. Eyerdam. Mr. F. Rilstone presented a number of hepatics and mosses from various parts of the world. The New Zealand Department of Agriculture sent specimens of recently described bryophytes, and the New York Botanical Garden sent a number of Fijian hepatics and mosses.

Mr. G. O. Allen has very kindly co-operated with the *Charophyta* as in former years.

A complete series of copies of more than five hundred drawings made by Dr. Fr. Verdoorn in the course of his monographic work on the *Frullaniaceae* and *Lejeuneaceae* have been purchased from the funds of the Bentham-Moxon Trustees and the Janet Perkins Bequest. These, together with the large series of the late Dr. Stephani's drawings of *Lejeuneaceae*, will be of considerable assistance in supplementing the descriptions, especially in the many cases where the species are unrepresented by specimens at Kew.

## THALLOPHYTA.

LICHENS AND ALGAE.—Several parcels of lichens were received in exchange. The Botaniska Museum, Helsingfors, sent 150 specimens, being fascicles 1-3 of *Lichenes Fenniae Exsiccati*, and the Riksmuseum, Stockholm, sent a number of Brazilian lichens. Small collections of algae have been presented from Uruguay, Barbados and Ceylon. Lichens and algae for naming were received from S. Australia, Canada, Somaliland, Sudan and China. Professor T. A. Stephenson who for some time has been sending S. African algae, has extended the range of his investigations to Natal and to Port Nolloth on the W. coast. From these areas good sets of specimens were sent in return for determinations supplied.

A number of enquiries during the year have related to seaweeds used in commerce.

Material sent on loan included *Stictaceae* to Dr. H. Allan, New Zealand; *Iridaea* spp. to Prof. W. A. Setchell, California; fresh-water genera to Prof. W. Troll, Munich; *Trentepohlia* spp. and *Chondrus* spp. to Dr. O. Schmidt, Berlin; *Fucus* spp. to Miss M. J. Lynn, Belfast; numerous sheets from the Leighton herbarium to the Natural History Museum, Vienna, for Dr. K. Redinger, and a large number of lichens of various genera to the National Museum of Natural History, Paris, for examination by Dr. J. Reichert, of Palestine.

Eight thousand cards of Tilden's *Index Algarum Universalis* were purchased. These have been sorted and incorporated with the previous part of the index.

FUNGI.—The outstanding addition was Mr. W. B. Grove's complete herbarium of *Coelomycetes*, consisting of 3,529 specimens both British and foreign. This has been presented to Kew by the Bentham-Moxon Trustees and was received at the end of the year. Other donations included a set of 100 *Basidiomycetes*, chiefly *Thelephoraceae*, from Professor H. S. Jackson of the University of Toronto, a small set of *Basidiomycetes* from the Central Experimental Farm, Ottawa (Miss I. Mounce), *Clavariaceae* from Iowa (Prof. G. S. Martin) and various interesting microfungi from Dr. Malcolm Wilson.

Collections of fungi for determination have been received from South Africa (Department of Agriculture, Pretoria), Uganda (Mr. C. G. Hansford), and Canada (Prof. H. S. Jackson and Miss I. Mounce), and critical *Thelephoraceae* from various correspondents in the United States.

During the early part of the year some considerable time was given to questions of fungus nomenclature, in connection with queries received from Dr. Connors of the Central Experimental Farm, Ottawa.

Much time has had to be devoted to protecting the mycological herbarium from attacks of beetles, which prevented progress being made with laying in and the work of renovating old sheets and covers.

*Publications.*—African Fungi collected by O. A. Høeg, 1929–30 (Forhandl. K. Norske Vidensk. Selsk., 9, 42–53, 1936).

Second List of Fungi and Diseases of Economic Plants in Tanganyika Territory, by G. B. Wallace (K.B. 1936, 234).

Preliminary List of Fungi and Diseases of Plants in Sierra Leone, by F. C. Deighton (K.B. 1936, 397).

List of Fungi collected in Sierra Leone, by F. C. Deighton (K.B. 1936, 424).

### SPIRIT COLLECTION.

The rapid growth of this valuable collection has necessitated the provision of additional storage room and the cellar below Wing B is being prepared to house a portion of the collections. 614 bottles have been added during the past year. The collection of *Orchidaceae* is making particular progress, and now includes species belonging to 258 of the 600 (approx.) recognised genera. Other valuable series include *Asclepiadaceae* (Tribe *Stapelieae*) and the genera *Campanula* and *Arisaema*. There are also a considerable number of type specimens, as well as material figured in various publications. An endeavour is being made to obtain a complete spirit collection of the various succulent plants in cultivation at Kew, since dried specimens of these groups are often of little value. A commencement has been made with *Cactaceae* and the genera formerly grouped under *Mesembryanthemum*.

### EXPERIMENTAL AND TRANSPLANT WORK.

Genetical research was continued at the Potterne Biological Station and at Kew on *Silene*, *Centaurea*, *Ranunculus*, and *Saxifraga*. Several lines of research in *Silene* were completed by the scoring of  $F_2$  and back-cross families, and work on further foreign stocks, their selfing, and their hybridization with British plants was commenced. In *Centaurea* the last of the  $F_2$  families were scored and arrangements made to complete the experimental part of the planned studies in this genus by 1941. Mr. E. M. Marsden-Jones is continuing research at Potterne on *Anagallis* (with Prof. F. E. Weiss), on *Solanum Dulcamara*, and on *Epilobium*. Investigation of the apomicts, microspecies, and variations of *Taraxacum* and *Clypeola* was continued at Kew.



The Transplant Experiments of the British Ecological Society at Potterne have completed the ninth year of their existence. The fourth biennial report is in press (Dec. 1936).

*Publications.*—Contacts between Plant Classification and Experimental Botany (Nature, 137, 563 : 1936).

Solanum Dulcamara and its Inflorescence (Bot. Soc. and Exch. Club 1935 Report, 82 : 1936).

Natural Selection and the Distribution of Plants (Proc. Roy. Soc. B. 121, 49 : 1936).

Researches on *Silene maritima* and *S. vulgaris* : XVI (K.B. 1936, 445).

#### SUMMARY.

The routine work, apart from naming, accomplished during 1936 is summarised as follows :—

Mounted	...	...	...	...	42,550 (approx.)*
Incorporated	...	...	...	...	40,350 (approx.)*
Duplicates distributed	...	...	...	...	15,176
Specimens received on loan	...	...	...	...	15,004
Specimens sent on loan	...	...	...	...	6,561
Specimens presented or purchased	...	...	...	...	57,269

\*Not including lower cryptogams.

#### FUMIGATION OF THE STORES.

During the autumn of 1936 a somewhat serious attack of insects was discovered in the stores. Specimens were submitted to Dr. A. B. Page of the Imperial College of Science and Technology, who reported that more than one species was present, but the damage appeared to be due almost exclusively to the ordinary herbarium beetle, *Sitodrepa panicea*. Dr. Page advised fumigation with hydrogen cyanide, and as there was such a vast mass of absorptive material in the building he recommended an unusually high concentration of gas, namely 30 oz. HCN per 1,000 cubic feet.

The work of fumigation was entrusted to the London Fumigation Company who undertook to carry out all the details of the operation. Zyklon was employed. The actual work was in charge of Mr. W. J. Rogers, and the following notes are based on a report submitted by him.

The stores were put under gas on December 1st and opened up on December 3rd, a competent operator being left on watch to act in the event of emergency. Three men were sent to seal up all cracks and crevices on November 30th, and a few floorboards were taken up on each floor to permit free circulation of gas between the

floors and the ceilings. The basement was also fumigated to ensure the necessary concentration being maintained on the ground-floor. The heat was left on.

The specimens were removed from contact with the walls, firstly to allow of ample air-space around the bundles, and to permit of a free penetration of gas from all sides ; and secondly, to assist subsequent dispersal of gas.

As it was feared that with so heavy a concentration the Zyklon lachrymator was likely to linger in the bundles after the premises had been passed as free from the dangerous HCN content, it was decided to use a certain proportion of Zyklon without lachrymator. Tins of Zyklon were placed in the various rooms on the morning of December 1st, the number of tins in each room varying according to the capacity of the room. Four men were detailed to open the tins and scatter the Zyklon. Under normal conditions two men would have sufficed to carry out this operation, but as the mask filters were not guaranteed to give protection for more than half the concentration used on this occasion, it was considered advisable for the men to work in pairs. One pair opened the tins in one room and proceeded to another gas-free room to change filters and to be on hand in case of accident. The second pair started only when the first pair were in the gas-free room. The first pair then waited for the other pair to pass them before starting on the third room—and so on. No difficulty was experienced during the dosing.

All Zyklon was distributed by 11.30 a.m. on December 1st. The building was opened for ventilation at 7.30 a.m. on December 3rd. Weather conditions were good, there being a fresh breeze and initial ventilation was rapid. Final clearance ("free for working purposes") was given on Saturday, December 5th, and check inspection was made on Monday, December 9th.

The figures were as follows :—

Capacity (Fumigation) ...	21,750 cu. ft.
Zyklon used ... ..	12 tins, 1,000 gms. each, HCN without lachrymator.
	7 tins, 1,000 gms. each, HCN with lachrymator.
	2 tins, 500 gms. each, HCN with lachrymator.

A certain number of tests were made during the fumigation, with both adults and larvae of *Sitodrepa panicea*. The insects were placed in envelopes of gas-proof paper and placed in the centre of bundles of specimens and carefully tied up. No signs of life were visible after the fumigation, whereas control specimens placed in similar envelopes in bundles which were not fumigated remained alive.

The work of fumigation was carried out with great care and precision by the London Fumigation Company. The entire cost was £30, and the results appear to be entirely satisfactory.

#### ILLUSTRATIONS AND PORTRAITS.

A large number of drawings and photographs were received during the year and incorporated in the collection. These include : 75 water-colour drawings prepared for the "Botanical Magazine", presented by the Royal Horticultural Society ; about 90 original water-colour drawings of plants from the Italian Riviera, presented by Mrs. S. E. Miller ; 106 sheets comprising about 165 water-colour drawings of *Narcissus*, *Lilium*, etc., by Walter Meyrick Meyrick-Jones, presented by his brother Dr. H. Meyrick-Jones through Professor Sir A. C. Seward ; 30 plates of the "Flowering Plants of South Africa" from Dr. Pole-Evans ; 25 photographs of plants from the Atlas Mountains, presented by Dr. R. Seligman. Copies of "Hooker's Icones Plantarum" were received from the Bentham-Moxon Trustees.

Mr. H. N. Ridley presented a collection, numbering about 1,500, of his original drawings, chiefly of *Orchidaceae*, *Cyperaceae*, *Scitamineae*, etc., and these will shortly be incorporated in the collection.

The Bentham-Moxon Trustees, with the assistance of the Janet Perkins Bequest, presented 505 tracings of original drawings of *Frullaniaceae* and *Lejeuniaceae* which were purchased from Dr. F. Verdoorn's private collection.

Photographs of types were received from the Imperial Forestry Institute, Oxford, the Missouri Botanical Garden, and Dr. C. Christensen, and many other photographs and drawings from various sources were also received and incorporated in the collection.

#### NOMENCLATURE AND BIBLIOGRAPHY.

In any year following an International Congress there are naturally very many outstanding nomenclature problems to be solved. At Amsterdam in 1935 Miss M. L. Green was appointed Secretary of two International Committees : The Special Committee for Phanerogamæ and Pteridophyta, and that for The Nomenclature of Economic Plants. Very satisfactory progress has been made. The members of the Special Committee for Phanerogamæ and Pteridophyta have investigated all cases of proposed *nomina generica conservanda* submitted to the Amsterdam Congress. The cases for and against the conservation of these names are to be found in Kew Bull. 1935, 83-88 ; Sprague, Synopsis of Proposals, 68-73 ; and Prelim. Opin. 25 ; and the proposed *nomina generica homonyma conservanda* are contained in Kew Bull. 1935, 341-544. Altogether over 340 names



were considered for conservation. All these cases have been investigated in detail, and as the Committee was appointed with full power of decision (see Proc. Int. Bot. Congr. **1**, 359 : 1936) it is now possible to publish a list of those names that have been conserved or rejected. This list will appear shortly in the "Kew Bulletin." In the meantime any botanist desiring to know whether a particular name has been conserved or not, may obtain full information by writing to the Secretary.

The Committee has also completed its investigation on the *nomina conservanda proposita* published in the International Rules, ed. 3, pp. 131-138. The report on these names will also be published shortly. The Committee has now under consideration the lists of *nomina ambigua* and *nomina confusa*, also the proposed changes in the list of standard species of Linnean generic names (*Phanerogamae*), and the examination of the list of standard species of *nomina generica conservanda*.

The work entrusted to the Members of the Special Committee for The Nomenclature of Economic Plants is well in hand, but owing to its very nature it must take some time to complete. Since some confusion exists amongst botanists as to this work, the text of the resolution adopted at Amsterdam may be quoted :—"That an International Committee be appointed to draw up a list of names of economic plants according to International Rules, and that this list may remain in use for a period of ten years."

A large number of lists containing names of economic plants has been received by the Secretary, including those sent by Dr. Burt Davy on behalf of many Forestry Institutions throughout the Empire, by the Pharmaceutical Society and by the staff of the Museums of the Royal Gardens, Kew. Altogether over 3,000 names have been received. The method of procedure adopted has been as follows :—names have been card-indexed and the duplicates removed ; the cards were then arranged alphabetically and divided into seven portions, one for each member of the committee. Each portion was typed out and sent to the member responsible for investigating the names. In order to save time the lists were dealt with in two instalments. Many members have returned instalment 1, and three portions of instalment 2 have also been returned, the names having been duly examined and corrected where necessary. When all names have been returned, it is intended to circulate the entire list to all members of the committee in order to obtain as high a degree of accuracy as may be possible. The card index with corrections up to date is available for consultation by the staff at Kew and by visitors.

There have been numerous nomenclatural enquiries throughout the year, and often the replies to these entail extensive research. In addition many lists of names intended for publication have been received for examination and correction.

The revision of the "Handlist of Coniferae and other Gymnosperms" has been completed, and the MS. sent to the printers.

Two members of the Staff became foundation members of the Society of Bibliography of Natural History which was founded in 1936.

*Publications.—Nomenclature*: Principal decisions concerning Nomenclature made by the Sixth International Botanical Congress (K.B. 1936, 185–188).

A note on the Himalayan Daphnes, including a note on typification (K.B. 1936, 441).

On the names of *Lilium Bolanderi* and *Lilium Kelloggii* (Lily Year-Book, 1936, 6).

*Bibliography*: Dates of Hooker's "Botanical Miscellany" (K.B. 1936, 85–95).

Johan Sebastian Miller's "Icones Novae" (Journ. Bot. 1936, 208).

A catalogue of papers concerning the dates of publication of natural history books (Botany by H. S. Marshall) (Journ. Soc. Bibliogr. Nat. Hist. 1, pt. 1: 1936).

*Terminology*: Technical terms in Ruellius' Dioscorides (K.B. 1936, 145–185).

#### INDEX KEWENSIS.

The compilation of Supplement 9 has proceeded steadily, and it is hoped that it will be completed early in 1937. The card catalogue is arranged alphabetically and is available for consultation by the staff and visiting botanists. The number of cards at the present time is approximately 37,000. This number of entries is already considerably larger than that included in the normal quinquennial supplement. The increase is accounted for partly by the addition of nearly two thousand names, which for one reason or another were omitted from the original Index and subsequent supplements. As pointed out in Kew Bull. 1934, App. 39, acknowledgment is due to the Bentham-Moxon Trustees for supplying extra help to investigate these omissions.

As is customary during the last year of the quinquennium, the compilers have visited the Libraries of the British Museum (Natural History) and of the Royal Horticultural Society to search through periodicals not received at Kew, and as a result a large number of names has been added. Preparation for the press has already been started on the generic names.

When the card index is complete a duplicate typed copy is prepared. This forms part of the permanent card index from 1921–1935, and also ensures against loss of the original cards in transit, 576

when printing is taking place. The Delegates of the Clarendon Press have again generously supplied help towards the expenses of the special typing required for the duplicate set of cards.

#### VISITORS.

The number of signatures in the Visitors' Book for the year 1936 was 5,479.

The following gave voluntary assistance :—Mr. H. N. Ridley again kindly assisted in naming Malayan specimens and Miss M. M. Whiting in arranging and classifying the Indo-Malayan material; Miss D. A. Chaytor and Mr. R. A. Blakelock gave assistance in the European section; Mr. D. P. Fanshawe assisted in naming European and other collections, and Mr. J. D. Snowden in the work on *Gramineae*; Miss M. D. Ker also again helped in the work of labelling Mr. Hubbard's large Australian collection.

Amongst frequent or regular visitors were members of the staffs of the Department of Botany, British Museum, the Imperial Mycological Institute, and the Imperial Forestry Institute, Oxford. The Staff employed by the Royal Horticultural Society in connection with the preparation of the Index Londinensis and the Botanical Magazine have worked in the Herbarium and Library throughout the year.

The most noteworthy or frequent visitors to the Herbarium were the following :—

Mr. A. H. G. Alston; Major G. Aylmer (Sudan).

Mr. E. G. Baker; Prof. E. Barnes (Madras); Mr. J. Bausch; Mr. W. J. Bean; Dr. G. Benl (Munich), Dr. G. R. Bisby, Dr. W. E. Blackall (Cottesloe, W. Australia); Mr. R. A. Blakelock; Dr. K. B. Boedijn (Buitenzorg); Dr. F. Boergesen (Copenhagen); Dr. N. L. Bor (Indian Forestry Service, Shillong, Assam); Mr. J. P. M. Brennan; Miss E. M. Bruce; Professor A. H. R. Buller (Winnipeg); Mr. I. H. Burkill; Mr. P. Buwalda (Gröningen).

Mlle. A. Camus (Paris); Miss D. A. Chaytor; Mr. J. Clausen (Stanford University, California); Mr. S. Clay; Miss L. M. Cranwell (New Zealand).

Dr. J. M. Dalziel; Mr. J. E. Dandy; Mr. A. G. Davis; Mr. F. C. Deighton (Sierra Leone); Mr. H. N. Dixon; Mr. H. L. Dunkley.

Mr. Michael Evanari (Hebrew University, Jerusalem); Mr. A. W. Exell.

Mr. W. P. Fang (Nanking); Mr. D. P. Fanshawe; Mr. M. A. Farghaly (Egyptian University, Cairo); Dr. H. R. Fletcher; Dr. B. Floderus (Stockholm).

Mr. H. B. Garrett (late Forest Office, Siam); Mr. W. B. Grove; Dr. Otto von Gumpenberg (Berlin).



Mr. M. R. Henderson (Singapore) ; Mr. J. H. Holland ; Dr. D. Hooper ; Mr. A. C. Hoyle.  
 Miss J. B. Imlay.  
 Mr. A. Bruce Jackson.  
 Miss M. D. Ker ; Dr. A. F. G. Kerr.  
 Mr. A. Percy Lancaster ; Mr. G. Lawrence ; Mr. J. G. Lousley.  
 Mr. E. W. Mason ; Mr. C. Matthews ; Dr. H. N. Moldenke (New York) ; Mrs. E. T. Moldenke (New York) ; Mr. B. O. Mulligan ; Mr. H. Muyser.  
 Mr. A. H. Nasr (Egyptian University, Cairo) ; Mr. R. M. Natrass (Cyprus).  
 Dr. H. R. Oppenheimer (Palestine).  
 Mr. T. Petch ; Mr. N. S. Pillans (Kirstenbosch) ; Mr. H. W. Pugsley.  
 Dr. J. Reichert (Palestine) ; Mr. H. N. Ridley.  
 Dr. Harold St. John (Hawaii) ; Mr. J. R. Sealy ; Prof. W. A. Setchell (Berkeley, California) ; Mr. W. A. Sledge ; Dr. N. J. G. Smith (Grahamstown) ; Mr. J. D. Snowden ; Miss M. S. Sprague ; Mr. W. T. Stearn ; Miss E. L. Stephens (Cape Town) ; Mr. W. T. Stevens ; Mr. C. F. Symington (Kepong, F.M.S.).  
 Mr. T. Tang (Peiping) ; Dr. G. Taylor ; Mr. H. Griffith Tedd (Xanthie, Greece) ; Mr. C. G. Trapnell (Mazabuka, N. Rhodesia).  
 Mr. F. T. Wang (Peiping) ; Mr. E. F. Warburg ; Dr. H. Weimarck (Lund, Sweden) ; Miss M. M. Whiting ; Mr. S. P. Wiltshire ; Mr. W. C. Worsdell.

#### DISTRIBUTION OF DUPLICATES.

The following were the principal institutions to which duplicates were distributed :—

*Great Britain.*—London, British Museum (Natural History) ; Oxford, Imperial Forestry Institute.

*Europe and Orient.*—Baku, Herbarium of the Academy of Sciences ; Berlin, Botanic Gardens and Museum ; Brno, Masaryk University ; Brussels, Botanic Garden ; Cluj, Botanical Museum ; Geneva, Museum and Botanic Garden ; Jerusalem, Hebrew University ; Kraków, Physiographical Museum ; Leiden, 's Rijks Herbarium ; Leningrad, Botanical Institute of the Academy of Sciences ; Madrid, Botanic Garden ; Paris, Natural History Museum ; Sarajevo, State Museum ; Stockholm, Natural History Museum ; Uppsala, Botanical Institution ; Utrecht, Botanical Museum and Herbarium ; Vienna, Natural History Museum.

*Asia.*—Buitenzorg, Botanic Gardens ; Manila, Bureau of Science ; Sapporo, Botanical Institute of the Faculty of Science, Hokkaidō Imperial University.

*Africa*.—Amani, East African Agricultural Research Station ; the Government of British Somaliland ; Pretoria, Division of Plant Industry.

*America*.—Bloomington, Indiana University ; Buenos Aires, Botanical Laboratory of the Faculty of Agriculture ; Cambridge, Gray Herbarium ; Chicago, Field Museum of Natural History ; Jamaica Plain, Arnold Arboretum ; La Plata, Museo de la Plata ; Los Angeles, University of California ; New York, Botanical Garden ; Ottawa, Central Experimental Farm ; Stanford University, Dudley Herbarium ; Toronto, The University ; Washington, D.C., United States National Museum.

*Australia and New Zealand*.—Brisbane, Botanic Museum and Herbarium ; Melbourne, National Herbarium ; Palmerston North, Plant Research Station.

*Oceania*.—Honolulu, Bernice P. Bishop Museum.

## The Library

The Library staff has been strengthened by the addition of a sub-assistant, and this has made it possible to take in hand various arrears of work.

A good start has been made in dealing with the arrears of cataloguing mentioned in last year's report, several hours being devoted daily to this task by the Assistant Librarian. In this connection a large number of pamphlets which had been for many years on shelves on the cellar landing have been removed and classified so that they are more readily available while awaiting cataloguing.

The press-marking of the books in the Library, made necessary by the subject rearrangement, has now been completed, except for the periodicals in the three corridors. Before these could be attended to it was necessary to relieve congestion. This was done by removing to the Museums Library the " Bulletin Economique de l'Indochine " from the Top Corridor, and one little-used periodical from each of the other corridors to the remaining vacant shelves on the cellar landing. Another necessary preliminary to the new press-marking of these publications was their spacing out to allow for the annual expansion of those still current. These tasks have been completed for the middle corridor, and the journals in the other two corridors are being similarly dealt with.

Three bibliographical papers published during 1936 are included under the heading " Nomenclature and Bibliography " (p. 576), as they deal with dates of publication of works containing new botanical names.

PRESENTATIONS TO THE LIBRARY.

The trustees of the British Museum :—W. Fawcett and A. B. Rendle, *Flora of Jamaica*, vol. 7, Dicotyledons, part 5, 1936.

The Crown Agents for the Colonies :—D. A. Bannerman, *The birds of Tropical West Africa*, vol. 4 ; J. Hutchinson and J. M. Dalziel, *Flora of West Tropical Africa*, vol. 2, pt. 2 (4 copies) ; *Vocabulary of Nigerian names of trees, shrubs, and herbs*.

Lieut.-Col. Sir David Prain, as in previous years, has sent various periodicals in continuation, and numerous other publications.

Two copies of the *Lily Year-Book* for 1935 (No. 4) and 1936 (No. 5) have been received from the Royal Horticultural Society. The Society has also presented a copy of *Cherries and soft fruits*, edited by F. J. Chittenden.

The Rhododendron Association has presented its *Year Book and Supplement*, 1935.

Among the publications received from the New York Botanical Garden during 1936 are *Addisonia* and the *North American Flora*, both in continuation.

Volumes 4 and 5 of the *Flora U.R.S.S.* and other works have been presented by the Botanical Institute of the Academy of Sciences, Leningrad.

Mr. H. Hamel Smith very kindly presented a collection of about 50 books on Temperate and Tropical Agriculture.

From the Director, Imperial Mycological Institute, Kew, have been received volumes 1, 2, 4, 5, and Index to volumes 1-4 of the *Flora U.R.S.S.*

During 1936 the Bentham-Moxon Trustees presented to the Library the following important works :—Barrere, P., *Essai sur l'histoire naturelle de la France equinoxiale*, Paris, 1741, an important early work on the flora of French Guiana ; Bennett, F. D., *Narrative of a whaling voyage round the globe*, London, 1840, 2 vols., with an appendix describing the botany ; Castellan, P., *Vitae illustrium medicorum*, Antwerp, 1618, containing accounts of the lives of early botanists ; Commelyn, C., *Horti medici Amstelædamensis Plantarum usualium catalogus*, Amsterdam, 1724, is the third edition of this work ; Descemet, J., *Catalogue des plantes du Jardin de Messieurs les Apoticaire de Paris*, 1759 ; Gesner, C., *Apparatus et Delectus Simplicium*, Basel, 1540, an important work in which the preparation and collection of many plants used medicinally are described. It is bound up with Gesner's edition of Actuarius (translated by Ruellius), *De medicamentorum compositione*, and forms a valuable addition to our set of Gesner's works ; Grapaldus, F. M., *De Partibus Aedium*, Strassburg, 1508, an early work which in spite of its architectural sounding title deals with spices, herbs, vegetables, fruits, beans and grains ; Hebenstreit, J. E. (1) *De methodo plantarum ex fructu optima*, Lipsiae, 1740, and (2) *Definitiones plantarum*, Lipsiae, 1731,

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bound up with the same author's *De sensu externo facultatum in plantis indice*, Lipsiae, 1730 ; Heister, L. (1) *Catalogus plantarum*, and (2) *Designatus plantarum quibus hoc anno MDCCXXI Hortum Academiae Iuliae* ; Ludwig, C. G., *Observationes in methodum plantarum sexualium*, Lipsiae, 1739, a work of historical importance ; Meissner, R., *Eine Deutsche Apothek des 16. Jahrhunderts*, Berlin, 1908, containing an account of the drugs employed in the composition of medicines used in the State Drug Shop at Kolberg in 1589 ; Mizauld, A., *Le Jardin medicinal*, Paris, 1578, has both a medical and a botanical interest and deals with the medicinal virtues of vegetables, herbs, fruits and flowers ; Plaz, A. G., *Foliorum in Plantis Historiam*, Lipsiae, 1740, deals with the morphology and terminology of leaves and is useful in interpreting contemporaneous descriptions ; Snowden, J. D., *The Cultivated races of Sorghum* (2 copies) ; Wollenweber, H. W., and O. A. Reinking, *Die Verbreitung der Fusarien in der Natur*, Berlin, 1935, together with plates 1,101-1,200 of Wollenweber's *Fusaria autographice delineata*.

The continuation of various periodicals, received in exchange for *Hooker's Icones Plantarum*, have been presented by the Bentham-Moxon Trustees, and also vols. 1 to 7, No. 4, of the *Journal of the Cactus and Succulent Society of America*.

The Editor of "Nature" has presented the following works :—H. Clinton-Baker and A. B. Jackson, *Illustrations of new conifers* ; Merle E. Coulter, *The story of the plant kingdom* ; E. H. M. Cox, *A history of gardening in Scotland* ; Lady Elphinstowe, *Botany for children* ; H. Gilbert-Carter, *Our catkin-bearing plants* (ed. 2) ; A. Guillaumin, *Les fleurs de jardins* ; H. E. Jacob, *The saga of coffee* (translated by Eden and Cedar Paul) ; H. McMinn and Evelyn Maino, *An illustrated manual of Pacific Coast Trees* ; F. K. Makins, *The identification of trees and shrubs* ; Harriett Price, *The junior gardener* ; Edith A. Roberts and Julia R. Lawrence, *American Ferns : How to know, grow and use them* ; W. Troll, *Vergleichende Morphologie der höheren Pflanzen*.

The following books have been received from the publishers, chiefly for review in the Kew Bulletin :—Allwood Bros. : M. C. Allwood, *Carnations and all Dianthus* ; Messrs. Edward Arnold : N. M. Comber, *An introduction to the scientific study of the soil* (ed. 3) ; H. Martin, *The scientific principles of plant protection, etc.* ; John Bale Sons & Danielsson : R. H. Crofton, *A pageant of the spice islands* ; G. D. Gray, *All about the Soya bean* ; Gebrüder Borntraeger : Engler-Diels, *Syllabus der Pflanzenfamilien*, 11 Auflage ; Chapman & Hall : A. L. Winton and K. B. Winton, *The structure and composition of foods* (vol. 2). *Vegetables, Legumes, Fruits* ; Country Life : E. A. Bunyard, *Old garden roses* ; D. Wilkie, *Gentians* ; Messrs. Macmillan : L. J. F. Brimble, *Intermediate botany* ; Sir Frederick Keeble and A. R. Rawes, *Hardy fruit growing* ; Louis C. C.

Krieger, *The mushroom handbook* ; Loraine E. Kuck and R. C. Tongg, *The tropical garden* ; E. Markham, *Raspberries and kindred fruits* ; L. Rowntree, *Hardy Californians* ; A. Sharples, *Diseases and pests of the rubber tree* ; McGraw-Hill Book Co. : R. P. Wodehouse, *Pollen grains* ; Oxford University Press : H. Gilbert-Carter, *British trees and shrubs, etc.* ; The Pharmaceutical Press : H. N. Linstead, *Poisons law ; a guide to the provisions of the Pharmacy and Poisons Acts, 1852 to 1933, and the Dangerous Drugs Acts, 1920 to 1932, for the use of Pharmacists, etc.*

Among the more important works received, presented by the authors unless otherwise stated, are the following : J. R. Ainslie, *Notes on native medicinal plants of Nigeria* (typescript) (from Dr. F. N. Howes) ; H. H. Allan, *An introduction to the grasses of New Zealand* (from the Department of Scientific and Industrial Research) ; O. Ames, *The genus Epidendrum in the United States, etc.* ; Enrique Perez Arbelaez, *Plantas útiles de Colombia*, vol. 1, 2 copies (from Ministerio de Agricultura y Comercio, Republica de Colombia) ; C. A. Backer, *Voorlooper eener Schoolfiora voor Java* (from Dr. D. F. van Slooten) ; J. G. Baker, (1) *Handbook of the Amaryllideae* ; (2) *Handbook of the Irideae* (interleaved copies from Mr. E. G. Baker) ; E. Battiscombe, *Trees and shrubs of Kenya Colony* (from the Conservator of Forests) ; R. H. Beddome, *The ferns of Southern India*, parts 1-17 and 19-20 (presented by Mrs. Bartle Grant) ; R. Bentley, *A manual of botany*, ed. 5, 1887 (from Mr. H. K. Airy-Shaw) ; F. Børgesen, *Marine algae from the Canary Islands, etc.*—IV. : *Cyanophyceae* ; *Botaniska Studien tillägnade F. R. Kjellman den 4 November, 1906* (from Botaniska Institutionen, Uppsala) ; *British Association for the Advancement of Science : A scientific survey of Blackpool and district, by various authors* (from Dr. W. B. Turrill) ; N. L. Britton and E. P. Killip, *Mimosaceae and Caesalpiniaceae of Colombia* (from Miss D. Oak) ; N. E. Brown's MS. on *Aloe brevifolia* Mill. (from Dr. J. Muir) ; H. G. Bull, *The mistletoe in Herefordshire* (Trans. Woolhope Nat. Field Club, 1852-1865) (from Dr. H. E. Durham) ; *Catalogue of British Scientific and Technical Books*, ed. 3, 1930 (from the Secretary, British Science Guild) ; L. Chalk and J. Burt Davy (Editors), *Forest trees and timbers of the British Empire. III.* (from the Librarian, Imperial Forestry Institute, Oxford) ; A. Chevalier, *Les Iles du Cap Vert. Flore de l'Archipel* ; G. R. Clarke, *The study of the soil in the field* (from the Imperial Forestry Institute) ; Mabel C. Coleclough, *A book of New Zealand Flora, etc.* ; A. X. P. Coutinho, *Esbôço de uma Flora Lenhosa Portuguesa* ; K. Domin, *Plantarum Cechoslovakiae Enumeratio* (Preslia 13-15) ; Sir Charles Fawcett, *The English factories in India. vol. 1* (new series) (*The Western Presidency*) 1670-1677 (from The Secretary of State for India) ; *Field notes of Rhododendrons and other plants collected by Kingdon Ward in 1935* (from Lionel de Rothschild) ; H. Fröderström, *The genus Sedum L.* ; W. W. Froggart, *Forest insects and timber borers*

(from Miss T. Y. Harris and Miss Crommelin, George Girls High School, Kogarah) ; J. S. Gamble, *Flora of the Presidency of Madras*, part 11, ... by C. E. C. Fischer (from the Secretary of State for India) ; P. Girod, *Manipulations de Botanique*, ed. 1, 1887 (from Mr. H. N. Ridley) ; D. H. Grist, *An outline of Malayan agriculture* (from Director of Agriculture, S.S.), *Handbook to British Malaya*, 1935 (from The Agent, The Malayan Information Agency) ; L. Hauman, *Les " Senecio " arborescents du Congo. (Résultats botaniques de l'expédition scientifique belge au Ruwenzori, 1932.—IV)* ; E. M. Holmes, *Catalogue of the Hanbury Herbarium* (from Mr. A. A. Bullock) ; J. S. Henkel and S. St. C. Ballenden, *An account of the plant ecology of the Dukuduku Forest Reserve, etc.* ; F. H. Hillman and Helen H. Henry, (1) *The more important forage plant seeds and incidental seeds commonly found with them.* (Photographs of drawings of seeds) ; (2) *A list of forage plant seeds and the incidental seeds commonly found with them* (from Principal Botanist in Charge, Bureau of Plant Industry, U.S. Department of Agriculture) ; A. B. Jackson, *Catalogue of the trees and shrubs (excluding Rhododendrons) at Borde Hill, Sussex* (from Lt.-Col. Stephenson Clarke) ; W. L. Jepson, *A Flora of California*, vol. 2, pts. 1 and 2 ; R. Kanehira, *Formosan trees*, revised ed., 1936 (from Department of Forestry, Government Research Institute, Taihoku, Formosa) ; J. D. Kennedy, *Forest flora of Southern Nigeria* (from the Chief Conservator of Forests, Nigeria) ; A. J. G. H. Kostermans, *Studies in South American Malpighiaceae, Lauraceae and Hernandiaceae, especially of Surinam* ; Langlet, O., *Studier över tallens fysiologiska variabilitet och dess samband med klimatet* ; Mrs. Man, *Album of drawings* (from Sir D. Prain) ; J. W. S. Marr, *The South Orkney Islands* (Discovery Reports X) from Mr. H. N. Dixon ; A. W. Menzies-Kitchen, *Land Settlement : A report prepared for the Carnegie United Kingdom Trustees* (from the Carnegie United Kingdom Trustees) ; H. W. Miles and Mary Miles, *Insect pests of glasshouse crops* (from the Editor, Mr. H. C. Long) ; H. N. Moldenke (1) *A monograph of the genus Callicarpa* ; (2) *A monograph of the genus Cornutia* ; (3) *A monograph of the genus Priva* ; H. J. Moore, (1) *The hardy perennials* ; (2) *The culture of flowers* ; S. Murbeck, *Nachträge zur Monographie der Gattung Verbascum* ; H. C. Navel, *Les principaux ennemis du Cacaoyer aux Iles de San-Thomé et de Principe* ; Fr. Noël, *Dictionnaire Latin-Français* (from Miss Harris Brown) ; J. Ohwi, *Cyperaceae Japonicae* ; L. R. Parodi, (1) *Las plantas forrajeras indígenas y cultivadas de la Republica Argentina* (from the Director, Universidad de Buenos Aires, Facultad de Agronomía y Veterinaria) ; (2) *Revision de las Gramineas argentinas del género " Sporobolus "* ; F. W. Pennell, *The Scrophulariaceae of Eastern Temperate North America* ; *Recueil dédié a M. le Prof. Dr. St. Petkoff au 70-e anniversaire de sa naissance* (from Dr. St. Petkoff) ; V. A. Reko, *Magische Gifte* (from Mr. H. N. Ridley) ; *Report of the British Association for the Advancement of Science*, 1935 (from Miss E. M. Wakefield) ; Thekla R. Resvoll, *Norske Fjellplanter* (from Miss



Mary Rathbone); W. von Roeder, *Sukkulenten* (from Dr. von Poellnitz); A. J. de Sampaio, *Primeira Conferencia Brasileira de Protecção a Natureza*; C. Schröter, *Flora des Südens*; J. J. Smith, *Ericaceae* (reprinted from Nova Guinea xviii. Bot.); T. A. Sprague, *Report Subsection for nomenclature, Sixth International Botanical Congress, Amsterdam*; F. Stockmans, *Végétaux eocènes des environs de Bruxelles*; Susan G. Stokes, *The genus Eriogonum*; l'Abbe Tous-saint, *Ronces de l'Eure et de la Seine-Inférieure*; Y. Tsiang, *Notes on the Asiatic Apocynales III.*; I. Tsuboi, *Monograph of Bamboos*. English translation (from Mr. B. Y. Morrison, U.S. Department of Agriculture); *Vocabulary of Nigerian names of trees, shrubs and herbs* (from the Forest Department, Nigeria); Miss M. Walter, *Some Jamaica wild flowers*; W. Marshall Watts, *A school flora*, etc. (from Mrs. Brackett); H. Drysdale Woodcock and J. Coutts, *Lilies: Their culture and management*, (ed. 2, 1936), (from Country Life); R. E. Woodson, jnr., *Studies in the Apocynaceae, IV.: The American genera of Echitoideae* (from the Director, Missouri Botanical Garden).

The following periodicals, additional to those mentioned in recent reviews, have been received. These have been presented by the editors, societies or institutions issuing them unless otherwise stated: *Acta Phytogeographica Suecica* II & VI (from Bibliotekarie, Universitetsbiblioteket, Upsala) and III: 1, IV & V (from Dr. G. Einar Du Rietz); *Australian Forestry*, vol. 1, no. 1 (from Mr. C. E. C. Fischer); *British Fern Gazette*, 37 numbers (from Dr. F. W. Mansfield), and vol. 6, nos. 11 & 12, vol. 7, no. 1 (from Mr. C. H. Wright); *Bulletin de la Société Dendrologique de France*, nos. 89-93 (from Mr. W. J. Bean); *Chanousia*, Ann. no. 1, 1922-27 (from Prof. L. Vaccari); *Darwiniana*, vol. 2, nos. 2-3 (from Prof. L. R. Parodi); *Indian Forester*, alphabetical index to vols. 1-17 (from Mrs. Gamble); *Lavori del R. Istituto di Palermo*, I-III; *Revista de la Facultad de Agronomia y Veterinaria*, vol. 1, pts. 1-3; vol. 2, pts. 1-3 (from the Director, Universidad de Buenos Aires, Facultad de Agronomia y Veterinaria); *Skrifter om Svalbard og Ishavet*, nos. 9, 38, 39, 41, 43-48, 55, 56 (from Norges Svalbard og Ishavsundersøkelser, Observatoriet, Oslo); *Specchio delle Scienze o Giornale Enciclopedica di Sicilia* (Photostat copy of several pages on which descriptions of new species appear) (from Dr. J. H. Barnhart); *Svenska Växt-sociologiska Sällskapets Handlingar*, vol. 8 (from Dr. G. Einar Du Rietz); *Sweet Pea Annual*, 1936; *Teysmannia*, vol. 30, pts. 7-12 & index (from Dr. C. G. G. J. van Steenis); *Travaux de l'Institut Botanique, édition medicale d'Etat*, vol. 1 (from the Université de Charkov).

Many publications have again been received from the Empire Cotton Growing Corporation, the Imperial Agricultural Bureaux and from many Departments of Botany, Agriculture and Forestry at home, in the overseas Empire, and in foreign countries.

A large number of botanical reprints have also been received from the authors.

Additional maps of the fifth (relief) edition have been received from the Ordnance Survey Office, Southampton. The War Office has also presented further maps as issued. Other maps received include a collection of 38, chiefly of Germany, from Col. F. R. Durham, four of Switzerland from Mr. W. M. Seyfried, two of the Belgian Congo from Dr. W. Robyns, four of Nyasaland made and presented by Mr. A. J. W. Hornby; one of Guerrero from Mr. A. A. Bullock; and one of the Belgian Congo from Mr. A. D. Cotton.

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